COMPASS Placement Test Preparation Packet

For preparing to take the COMPASS Math Placement Test

Funded through the Gulf-Coast PASS Grant

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The

COMPASS Test

The COMPASS Test

The COMPASS placement test is offered in Reading, Writing, and Math. The test helps to determine whether you have the knowledge to succeed in the classes you are planning to take or whether taking some preparatory classes will ensure your success. Taking the three tests separately is usually helpful to ensure best results in all three tests.

The COMPASS test is a self-adjusting, multiple choice test that is taken at the computer. The answer to your current question will determine the next question; it will stop once it has determined your level. Consequently the test is untimed and has a different number of questions for each student. It also means that you will see questions that you don't know, because the test will ask you more and more difficult questions until it has found something that you don't know. Just do your best you can for each question the test presents to you.

You will receive paper, pencil, and a calculator. Since you will work on the computer you will not be allowed to bring food or drink. Once you have completed a test you will receive a printout with your scores and a recommendation of classes to take. You should then make an appointment with an advisor to discuss your course work.

The COMPASS Mathematics Test is an untimed, multiple-choice, computer-based test composed of four sections: numerical skills/pre-algebra, algebra, college algebra, and trigonometry. Students' need for mathematics remediation is based on results of the first two sections of the test: numerical skills/pre-algebra and algebra. Students must achieve scaled scores of 30 or above on each of these two sections to satisfy the basic skills

Advising

The Advising process is an integral part of your academic success. Academic advisors are available to assist you with a variety of academic services including admissions, testing, advising, registration, referral of campus and community resources, add/drop/withdrawal process, transfer planning and graduation processes.

Check out our advising resources at http://www.lonestar.edu/advising.htm but don't hesitate to contact an advisor if you need additional assistance. They're here to help you! It is very important that you are placed into the correct mathematics course.

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Test-taking Strategies

1. **Take the Placement Test Seriously**
   Giving your best during the test can save you several terms of math, reading, and writing classes, and therefore a lot of time and money. What you don't know, you don't know. That's fine. But if you know something, make sure you show it on the test so that you are placed into the appropriate class for your skill level.

2. **Prepare For the Test**
   It is important that you review your knowledge before you take the test, particularly if you have not been in school for many years. Go over the following parts in this review packet to refresh your memory about the things you once knew. This packet is not designed to help you learn material that you never knew. For that you should take a class.

   It is equally important, however, that you are physically prepared for the test. Be sure to get enough sleep the night before, and eat something nutritious before arriving for the test. Don't consume anything with caffeine or a lot of sugar right before the test. Caffeine might make you feel more jittery and less patient, causing you to skip important steps. Too much sugar will give you a short energy boost followed by a sense of fatigue. Drink water or tea instead.

3. **Take Time**
   The Compass Test is not timed which means that you can take as much time as you need. Make use of that! Read the questions carefully, think about them, do your work on paper, and then choose an answer. Your score does not depend on how long you take for each question. Your score *only* depends on whether you choose the right answer.

4. **Read the Questions Carefully**
   Don't assume anything. Follow the instructions of the question exactly. Read all the details very carefully. A simple 'NOT' can change everything around. It helps to copy the question onto paper and underline the important information or rewrite it in your own words.

5. **Work Math Problems out on Paper**
   Since the COMPASS Test is a test that you take on the computer make sure to copy math problems onto paper and work them step by step. It's worth it! Working a problem out carefully and minding all the details gets you the points to place you in the right class.

6. **Take a Break**
   You can take a break whenever you like! Just go to the testing supervisor, and s/he will save your work. You can continue when you come back. You can even come back the next day. This is very important because in order to do well on the test you need to concentrate. So if you need to use the restroom, go. If you are thirsty or hungry, go drink and eat. If you are tired, get up and take a walk or go home and come back the next day.

Section 2

For the Teacher

Did you know…?

- That the PreAlgebra portion of the test is composed almost entirely of **word problems**?

- That students have to do approximately 20 PreAlgebra word problems before they can begin the Algebra portion of the test?

- That many, many college students have to take Developmental Math classes simply because they did not practice math before taking the COMPASS?

- That students have access to an online calculator during the entire test?

- That the calculator is the same calculator found on every computer using Window?

- That the calculator can be changed from a standard to a scientific calculator by selecting view and then scientific?

- That you can take the COMPASS test yourself to see what your students will see?

- That you can play an important role by helping students…

  - realize how important it is to prepare for the COMPASS

  - understand the need to get the initial questions correct (so they can get to the more difficult, higher placing questions)

  - provide them the opportunity to practice using COMPASS type questions

  - help them learn how to use the calculator on the computer

Numerical Skills/PreAlgebra and Algebra Tests:

The Seven Topics Covered by the PreAlgebra Section of the COMPASS:

    1. Basic Operations (Integers)

    2. Basic Operations (Fractions)

    3. Basic Operations (Decimals)

    4. Exponents, Square Roots, and Scientific Notation

    5. Ratios and Proportions

    6. Percentages

    7. Averages (means, medians, and modes)

The Eight Topics Covered by the Algebra Section of the COMPASS:

    1. Substituting Values into Algebraic Expressions

    2. Setting Up Equations for Given Situations

    3. Basic Operations with Polynomials

    4. Factoring Polynomials

    5. Linear Equations in One Variable

    6. Exponents and Radicals

    7. Rational Expressions

    8. Linear Equations in Two Variables

Section 3

For the Student

Did you know…

- That the COMPASS test is one of the most important tests you will take during college?

- That how well you do on the COMPASS test will determine which classes you are placed in during your first year of college?

- Taking the COMPASS test unprepared may add a year or more to your time in college and cost thousands of dollars more?

- Many college students are placed in Developmental Math classes that they do not really need only because they did not take the time to prepare for the COMPASS?

- That you will have a calculator available while taking the COMPASS (just like the one in Windows on your computer?

- That you need to get the beginning questions correct so that you will be able to answer the later, higher-placing questions?

Would you go run a marathon without training?

Would you take the SAT or ACT for entrance to a university without preparing?

Neither should you take the COMPASS test without preparation.

You might ask, "How do I prepare?"

For a couple of weeks before the test, practice COMPASS type questions every day to build up your math muscles.

Also, practice using the calculator – the one on your computer.

There are many strategies that will help you improve your score on the COMPASS Test. Combining these basic strategies with review and practice of the test material will help you achieve the math placement you desire.

Why You Should Study For The COMPASS Test

The score you earn on the COMPASS Test will determine which math classes you will need to take. The lower your score is, the more entry level classes you'll be required to take. If you can improve your COMPASS Test score you can avoid taking one or more entire semesters of college math! Skipping a couple math classes can make a substantial difference in your degree progress.

This website specifically focuses on helping students score well on the algebra and pre-algebra segments of the COMPASS Test. Doing well on these two basic subjects is crucial to achieving a good overall test score. **If you can perform well on the COMPASS algebra and pre-algebra sections you will be placed one or two classes above where you would've had you not done well here**. To save yourself the time and cost of taking these classes through your school, take the time now to review our study guide and practice questions and improve your COMPASS Test score!

Five Tips To Follow

1. The test is not timed, so breathe, relax, and work at your own pace.
2. Use the same calculator to practice for and take the actual test; it's good to keep as many things familiar as possible.
3. If you cannot answer a question, eliminate as many answers as possible and guess; there is no penalty for incorrect answers.
4. If you know how to solve a question, solve it first then look for your solution in the answer list. If you find it, move on and don't second guess yourself.
5. Don't panic: you've studied for this and are prepared. You will even have a chance to retake the test if you mess up. Just focus on answering the questions you know and guessing on the rest. Focus only on answering the question at hand and do not worry about anything else.

Confidence Is Key

Apart from knowledge of the material, the most important factor for successful testing is confidence. If you're confident you won't tense up, second guess yourself, or panic, and you'll perform much better. The best way to build up your confidence is to prepare for the test by studying the material, and then to focus on answering the questions you've studied for, just like you did in practice. You don't need to get every question right; don't stress if you are clueless about some of the questions, just guess on these and move on to more familiar territory. Remember that the test is merely a monitored extension of your studies: don't treat it as something foreign or scary.

If pressure really gets to you then you could try this tip: just before you begin the test shift your mind-state to broad external ideas. Try to 'zoom out' and focus on all the natural and human occurrences taking place around the world that are totally independent of your control. This can help put things in perspective and bring some calm. Try to carry this calm feeling into the test as you shift your focus to answering the questions.

Finally, check to see if your school allows multiple attempts at the test (many do). If you are not successful on your first attempt, you may be able to take the test once or twice more to try and get the score you need. If you do not pass the first time, treat the failure as a learning experience and move on with the extra knowledge you've gained about the test from your first attempt. With

a little extra preparation you are likely to do much better on your second attempt.

The Study Guide

To help you prepare for the COMPASS Test we have provided a free study guide covering the most important topics you'll need to know. Study these lessons and work on the practice questions included with each of them. Once you've gone through the lessons, you can test your overall knowledge by taking the free practice tests we've created. If you spend enough time studying the lessons you should do well on the practice tests, and if you do well on the practice tests you should do well on the actual test.

http://www.mycompasstest.com/exam-strategy/

http://www.mycompasstest.com/study-guide/

We've created a free study guide with lessons on the most important topics you'll need to know to score well on the Pre-Algebra and Algebra portions of the COMPASS Test. Review each lesson and complete the practice questions at the end to prepare for the test. Move on to the practice tests once you complete the study guide.

Pre-Algebra
- Integers
- Fractions
- Decimals
- Basic Exponents
- Order of Operations
- Ratios and Proportions
- Percentages

- Basic Statistics

Algebra
- Substituting Values
- Setting up Equations
- Linear Equations
- Polynomials
- Exponents and Radicals
- Rational Expressions

These practice exams will test your knowledge of the different pre-algebra and algebra topics on the COMPASS Test. The actual test will be multiple choice, but our practice tests are not. Even on multiple choice tests it is best to solve each question first, and then look for your answer among the choices. If you don't know how to solve a particular problem, make an educated guess and move on.

The actual test is administered on a computer and generates one question at a time, choosing the difficulty of future questions based on the previous scores.
If you are struggling with a certain type of question review the lesson on that particular topic.

http://www.mycompasstest.com/practice-tests/practice-test-1/

http://www.mycompasstest.com/practice-tests/practice-test-2/

Section 4

About the COMPASS Calculator
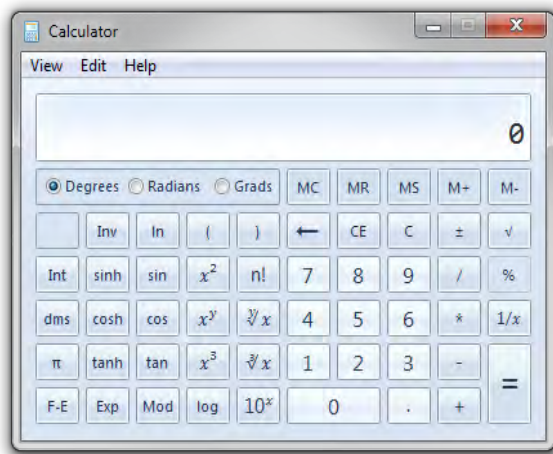
Microsoft Windows 7 Calculator

To employ the calculator got to your START MENU

→Programs → Accessories → Calculator

Change it to **Scientific Mode** immediately by clicking "View". Next make sure you click "scientific" AND "basic".

If you do not have Windows 7 at home, please come by the computer lab to practice!

a. $2^4 = 16$

| 2 | x^y | 4 | = |

b. $-2^4 = -16$

| − | 2 | x^y | 4 | = |

c. $(-2)^4 = 16$

| 2 | ± | x^y | 4 | = |

d. $-3^2 = -9$

| − | 3 | x^2 | = |

OR

| − | 3 | x^y | 2 | = |

e. $(-3)^2 = 9$

| 3 | ± | x^2 | = |

OR

| 3 | ± | x^y | 2 | = |
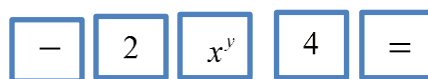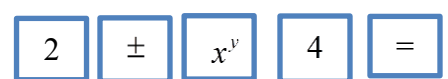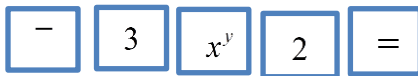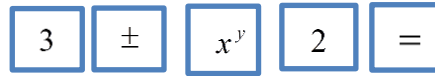
f. $\sqrt{4} = 2$ which is equivalent to   g. $4^{1/2} = 2$

| 4 | $\sqrt{}$ |

| 4 | x^y | (| 1 | / | 2 |) | = |
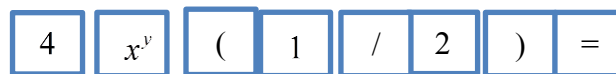
h. $8^{5/3}$ which is equivalent to   g. $\sqrt[3]{8^5} = 32$

| 8 | x^y | (| 5 | / | 3 |) | = |

| 8 | $\sqrt[3]{}$ | x^y | 5 | = |
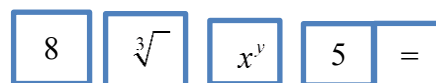
Notice | ± | is used when parenthesis are involved. (use this when substituting)

Calculator Interface

Windows Calculator
on the COMPASS

COMPASS Math Test   Calculator | Help

What is the sum of the solutions of the equation $x^2 + 8x + 15 = 0$?
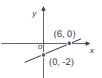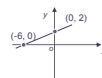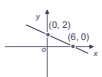
- ☐ A. 8
- ☑ B. -8
- ☐ C. 2
- ☐ D. -2
- ☐ E. 15

Go on

COMPASS Math Test   Calculator | Help

Which of the following is a graph in the standard coordinate plane of the equation $x - 3y = 6$?

- ☑ A.
- ☐ B.
- ☐ C.
- ☐ D.
- ☐ E. ☹

Go on

COMPASS Math Test   Calculator | Help

$$25^{\frac{3}{2}} =$$

- ☐ A. 37.5
- ☐ B. $\dfrac{75}{2}$
- ☐ C. 15
- ☐ D. 125
- ☐ E. 8.5

Go on

Standard View Calculator

- The standard view calculator believes

  3 + 2 * 5 = 25

- Switch to scientific view as soon as possible.

- Click View and Scientific

Scientific Calculator

23

1

Using the scientific calculator

$$25^{\frac{3}{2}} =$$

- For most problems the scientific calculator is not an advantage.
- However, this expression can be entered directly into the calculator.
- 25 x^y (3 / 2) = 125

| 2 | 5 | x^y | (| 3 | / | 2 |) | = |

COMPASS Math Test   Calculator   Help

$$25^{\frac{3}{2}} =$$

☐ A. 37.5   ☐ B. $\dfrac{75}{2}$

☐ C. 15   ☑ D. 125

☐ E. 8.5

Go on

Math Test Keyboard Commands

- "A, B, C, D, E" selects that answer.
- "L" activates Windows Calculator Accessory.
- Change to scientific view.
- "H" activates help screen.
- "G" Confirms answer and moves you to the next question.

Go on

24
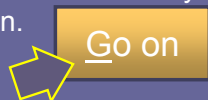
Section 5

PreAlgebra

Practice

Averages and Rounding Practice Questions

1. Round 907.457 to the nearest tens place.

A. 908.0
B. 910
C. 907.5
D. 900
E. 907.46

2. At a certain high school, the respective weights for the following subjects are:
Mathematics 3, English 3, History 2, Science 2 and Art 1.
What is a student's average whose marks were the following: Geometry 89, American Literature 92, American History 94, Biology 81, and Sculpture 85?

A. 85.7
B. 87.8
C. 88.9
D. 89.4
E. 90.2

3. Ginger over the course of an average work-week wanted to see how much she spent on lunch daily. On Monday and Thursday, she spent $5.43 total. On Tuesday and Wednesday, she spent $3.54 on each day. On Friday, she spent $7.89 on lunch. What was her average daily cost?

A. $3.19
B. $3.75
C. $3.90
D. $5.17
E. $4.23

4. What is 1230.932567 rounded to the nearest hundredths place?

A. 1200
B. 1230.9326
C. 1230.93
D. 1230
E. 1230.933

5. Subtract the following numbers rounded to the nearest tenths place.
134.679
-45.548
-67.8807

A. 21.3
B. 21.25
C. -58.97
D. -59.0
E. 1

6. What is the absolute value of -9?

A. -9
B. 9
C. 0

D. -1
E. 1

7. What is the median of the following list of numbers? 4, 5, 7, 9, 10, 12

A. 6
B. 7.5
C. 7.8
D. 8
E. 9

8. What is the mathematical average of the number of weeks in a year, seasons in a year, and the number of days in January?

A. 36
B. 33
C. 32
D. 31
E. 29

9. In a college, some courses contribute more towards an overall GPA than other courses. For example, a science class is worth 4 points; mathematics is worth 3 points; history is worth 2 points; and English is worth 3 points. The values of the grade letters are as follows, A= 4, B=3, C=2, D=1, F=0. What is the GPA of a student who made a "C" in Trigonometry, a "B" in American History, an "A" in Botany, and a "B" in Microbiology?

A. 2.59
B. 2.86
C. 3.08
D. 3.33
E. 3.67

10. Over the course of a week, Fred spent $28.49 on lunch. What was the average cost per day?

A. $4.07
B. $3.57
C. $6.51
D. $2.93
E. $5.41

11. A roast was cooked at 325° F in the oven for 4 hours. The internal temperature rose from 32° F to 145° F. What was the average rise in temperature per hour?

A. 20.2° F/hr
B. 28.25° F/hr
C. 32.03° F/hr
D. 37° F/hr
E. 37.29° F/hr

12. In the number 743.25 which digit represents the tenths space?

A. 2
B. 3
C. 4
D. 5
E. 6

Answers & Explanations

1. **B:** When rounding the decimal to the nearest tens place, look to the digit that is one place to the right, or the ones place. Since the digit in the ones place is greater than 5, the number will be rounded up to the next 10, giving a rounded number of 910.

2. **C:** The weighted average may be written as $(3·89)+(3·92)+(2·94)+(2·81)+(1·85)/11$, which is approximately 88.9.

3. **D:** The average daily cost may be written as $5.43+5.43+3.54+3.54+7.89/5$, which equals 5.17. The average daily cost was $5.17.

4. **C:** When rounding the decimal to the nearest hundredths place, look to the digit that is one place to the right, or the thousandths place. Since the digit in the thousandths place is less than 5, the digit in the hundredths place will remain. Thus, the rounded number is 1230.93.

5. **A:** The decimals of 45.5 and 67.9 should be subtracted from the decimal, 134.7. Doing so gives a difference of 21.3.

6. **B:** The absolute value of a number is the distance the number is from 0. The integer, -9, is 9 units from the whole number, 0. Thus, it has an absolute value of 9.

7. **D:** Since this list (already written in ascending order) has an even number of values, the median is the average of the two middle values. The average of 7 and 9 is 8, thus the median is 8.

8. **E:** Since there are 52 weeks and 4 seasons in a year and 31 days in January, the average may be written as $52+4+31/3$, which equals 29.

9. **C:** The GPA may be written as $(4·4)^3+(4·3)+(2·3)+(3·2)/13$, where 13 represents the sum of the weights. Thus, the GPA is approximately 3.08.

10. **A:** The average is equal to the ratio of the amount spent to the number of days in a week. Thus, the average may be written as 28.49/7. He spent an average of $4.07 per day.

11. **B:** The rate may be written as 145-32/4, which equals 28.25. Thus, the average rise in temperature per hour was 28.25°.

12. **A:** The tenths place is one place to the right of the decimal. Thus, 2 represents the digit in the tenths place.

Percent and Ratio Practice Questions

1. If a discount of 25% off the retail price of a desk saves Mark $45, how much did he pay for the desk?

    A. $135
    B. $160
    C. $180
    D. $210
    E. $215

2. A customer pays $1,100 in state taxes on a newly purchased car. What is the value of the car if state taxes are 8.9% of the value?

    A. $9.765.45
    B. $10,876.90
    C. $12,359.55
    D. $14,345.48
    E. $15,745.45

3. How many years does Steven need to invest his $3,000 at 7% to earn $210 in simple interest?

    A. 1 year
    B. 2 years
    C. 3 years
    D. 4 years
    E. 5 years

4. Sabrina's boss states that she will increase Sabrina's salary from $12,000 to $14,000 per year if she enrolls in business courses at a local community college. What percent increase in salary will result from Sabrina taking the business courses?

    A. 15%
    B. 16.7%
    C. 17.2%
    D. 85%
    E. 117%

5. 35% of what number is 70?

    A. 100
    B. 110
    C. 150
    D. 175
    E. 200

6. What number is 5% of 2000?

    A. 50
    B. 100
    C. 150
    D. 200
    E. 250

7. What percent of 90 is 27?

    A. 15%
    B. 20%
    C. 30%

D. 33%
E. 41%

8. Jim works for $15.50 per hour for a health care facility. He is supposed to get a 75 cent per hour raise at one year of service. What will his percent increase in hourly pay be?

A. 2.7%
B. 3.3%
C. 133%
D. 4.8%
E. 105%

9. If 45 is 120% of a number, what is 80% of the same number?

A. 30
B. 32
C. 36
D. 38
E. 41

10. How long will Lucy have to wait before her $2,500 invested at 6% earns $600 in simple interest?

A. 2 years
B. 3 years
C. 4 years
D. 5 years
E. 6 years

11. What is 35% of a number if 12 is 15% of a number?

A. 5
B. 12
C. 28
D. 33
E. 62

12. A computer is on sale for $1600, which is a 20% discount off the regular price. What is the regular price?

A. $1800
B. $1900
C. $2000
D. $2100
E. $2200

13. A car dealer sells a SUV for $39,000, which represents a 25% markup over the dealer's cost. What was the cost of the SUV to the dealer?

A. $29,250
B. $31,200
C. $32,500
D. $33,800
E. $33,999

14. After having to pay increased income taxes this year, Edmond has to sell his BMW. Edmond bought the car for $49,000, but he sold it for a 20% loss. What did Edmond sell the car for?

A. $24,200
B. $28,900
C. $35,600
D. $37,300
E. $39,200

15. At a company fish fry, ½ in attendance are employees. Employees' spouses are 1/3 of the attendance. What is the percentage of the people in attendance who are not employees or employee spouses?

- A. 10.5%
- B. 16.7%
- C. 25%
- D. 32.3%
- E. 38%

16. If 6 is 24% of a number, what is 40% of the same number

- A. 8
- B. 10
- C. 15
- D. 20
- E. 25

17. 25% of 400 =

- A. 100
- B. 200
- C. 800
- D. 10,000
- E. 12,000

18. 22% of $900 =

- A. 90
- B. 198
- C. 250
- D. 325
- E. 375

19. Which of the following percentages is equal to 0.45?

- A. 0.045%
- B. 0.45%
- C. 4.5%
- D. 45%
- E. 0.0045%

20. Which of these percentages equals 1.25?

- A. 0.125%
- B. 12.5%
- C. 125%
- D. 1250%
- E. 1250.5%

Answers & Explanations

1. **A:** The original price of the desk may be found by solving the equation, $0.25x = 45$. Thus, $x = 180$. However, this is the original price of the desk. Since he saves $45, he pays $45 less, or $135.

2. **C:** The following equation may be used to find the value of the car: $1,100 = 0.089x$. Solving for x gives $x \approx 12,359.55$. Thus, the value of the car is $12,359.55.

3. **A:** The formula, I = Prt, represents the amount of interest earned, for a particular principal, interest rate, and amount of time. Substituting 210 for I, 3000 for P and 0.07 for r gives: 210 = 3000(0.07)t. Solving for t gives t = 1. Thus, he will earn $210 in interest, after 1 year.

4. **B:** The percent increase may be modeled by the expression, (14,000-12,000)/12,000, which equals 16.7%.

5. **E:** The equation, 0.35x = 70, may be used to solve the problem. Dividing both sides of the equation by 0.35 gives x = 200.

6. **B:** The problem may be modeled as x = 0.05(2000). Thus, 100 is 5% of 2000.

7. **C:** The problem may be modeled as 90x = 27. Dividing both sides of the equation by 90 gives x = 0.3 or 30%.

8. **D:** The percent increase may be modeled by the expression, 0.75/15.50, which is approximately 0.048, or 4.8%.

9. **A:** The first part of the problem may be modeled with the equation, 45 = 1.2x. Solving for x gives x = 37.5. 80% of 37.5 may be written as 0.80(37.5), which equals 30.

10. **C:** The formula, I = Prt, represents the amount of interest earned, for a particular principal, interest rate, and amount of time. Substituting 600 for I, 2500 for P and 0.06 for r gives: 600 = 2500(0.06)t. Solving for t gives t = 4. Thus, she will have to wait 4 years to earn $600 in interest.

11. **C:** The second part of the problem may be modeled with the equation, 12 = 0.15x. Solving for x gives x = 80. Thus, the number is 80. 35% of 80 may be written as 0.35(80), which equals 28.

12. **C:** The sale price of the computer is 80% of the regular price. Thus, the following equation may be used to solve the problem: 1600 = 0.80x. Solving for x gives x = 2000. Thus, the regular price of the computer is $2000.

13. **B:** The following equation may be used to solve the problem: 0.25=(39,000-x)/x. Multiplying both sides of the equation by x gives 0.25x = 39,000 - x. Adding x to both sides of the equation gives 1.25x = 39,000, where x = 31,200. Thus, the cost of the SUV to the dealer was $31,200.

14. **E:** The problem may be modeled by the expression, 49,000 - (0.20(49,000)), which equals 39,200. Thus, he had to sell the car for $39,200.

15. **B:** The attendance of employees and spouses may be modeled as 1/2+1/3, or 5/6. Thus, 1/6 of those, in attendance, who are not employees or spouses, is approximately 16.7%.

16. **B:** The first part of the problem may be modeled with the equation, 6 = 0.24x. Solving for x gives x = 25. Thus, the number is 25. 40% of this number may be written as 0.40(25), which equals 10.

17. **A:** The problem may be modeled as 0.25(400), which equals 100.

18. **B:** The problem may be modeled as 0.22(900), which equals 198.

19. **D:** The percentage may be obtained by multiplying 0.45 by 100. Doing so gives 45%.

20. **C:** The percentage may be obtained by multiplying 1.25 by 100. Doing so gives 125%.

More Percent and Ratio Practice Questions

1. Express fourteen hundredths as a percent.

    A. 0.14%
    B. 14%
    C. 0.014%
    D. 1.4%

2. 3 is what percent of 50?

    A. 3%
    B. 4%
    C. 5%
    D. 6%

3. The ratio of 2:10 is the same as what percentage?

    A. 2%
    B. 5%
    C. 10%
    D. 20%

4. Lauren had $80 in her savings account. When she received her paycheck, she made a deposit which brought the balance up to $120. By what percentage did the total amount in her account increase as a result of this deposit?

    A. 50%
    B. 40%
    C. 35%
    D. 80%

5. Round to the nearest whole number: What is 17/68, as a percent?

    A. 17%
    B. 25%
    C. 40%
    D. 68%

6. Round to the nearest whole number: Gerald made 13 out of the 22 shots he took in the basketball game. What was his shooting percentage?

    A. 13%
    B. 22%
    C. 59%
    D. 67%

7. Change the following fraction to the simplest possible ratio: 8/14

    A. 4:3
    B. 4:6
    C. 4:7
    D. 3:4

8. If 5 people buy 3 pens each and 3 people buy 7 pencils each, what is the ratio of the total number of pens to the total number of pencils?

    A. 15 :21
    B. 3:7

C. 5:3
D. 1:1

9. In a town, the ratio of men to women is 2:1. If the number of women in the town is doubled, what will be the new ratio of men to women?

    A. 1:2
    B. 1:1
    C. 2:1
    D. 3:1

10. A man's lawn grass is 3 inches high. He mows the lawn and cuts off 30% of its height. How tall will the grass be after the lawn is mowed?

    A. 0.9 inches
    B. 2.1 inches
    C. 2.7 inches
    D. 2.9 inches

Answers and Explanations

1. **B:** "Fourteen hundredths" can be written as 0.14. To convert to a percent, move the decimal point two places to the right and add the percent sign.

2. **D:** Divide 3 by 50 to get 0.06 or 6%.

3. **D:** Divide 2 by 10 (not 10 by 2) to get 0.2 or 20%.

4. **A:** The rate of increase equals the change in the account balance divided by the original amount, $80. Multiply that decimal by 100 to yield the percentage of increase. To determine the change in the balance, subtract the original amount from the new balance: Change in account balance = $120 $80 = $40. Now, determine the percentage of increase as described above: Percent=$40/$80*100=50%

5. **B:** The answer is 25%. This problem requires you to understand how to convert fractions into percentages. One way to make this conversion is to divide 17 by 68 using long division, which will create a decimal quotient, and then convert this decimal into a percentage. 17/68 = 0.25 = 25%

6. **C:** The answer is 59%. To solve this problem, you must know how to convert a fraction into a percentage. Gerald made 13 out of 22 shots, a performance that can also be expressed by the fraction 13/22. 13/22 = 0.5909 = 59%

7. **A:** To solve this problem, you must know how to convert fractions into ratios. A ratio expresses the relationship between two numbers. For instance, the ratio 2:3 suggests that for every 2 of one thing, there will be 3 of another. This equates to a fraction of 2/5 because there are 5 things total. If we applied this ratio to the length and width of a rectangle, for instance, we could say that for every 2 units of width, the rectangle must have 3 units of length. We could also say that 2/5 of the perimeter is from the width and 3/5 is from the length. The fraction 8/14 is equivalent to the ratio 8:6. To simplify the ratio, divide both sides by the greatest common factor, 2. The simplest form of this ratio is 4:3.

8. **A:** First, find the total number of pens: 5 3 = 15 Then, find the total number of pencils: 3 7 = 21 Finally, express it as a ratio: 15:21

9. **B:** Currently, there are two men for every woman. If the number of women is doubled (1 2 = 2), then the new ratio is 2:2. This is equivalent to 1:1.

10. **B:** First, calculate 30% of 3 inches: 3 0.30 = 0.9 inches. Then, subtract this value from the original length: 3 â€" 0.9 = 2.1

by <u>Enoch Morrison</u>
Last Updated: 02/07/2013

Oakland Community College: Math Practice Test

PreAlgebra # 1-14

Algebra # 15-39
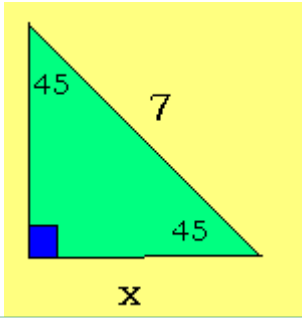
College Algebra # 40-56

Trigonometry # 57-60

Oakland Community College: Math Practice Test

1. **Basic Operations with Integers**: $36+(-20)+50-(-17)-10=$	2. **Basic Operations with Fractions**: What number added to $\frac{1}{3}$ plus $\frac{1}{4}$ will equal the number 1?
3. **Basic Operations with Decimals**: $36 \div 0.4 =$	4. **Basic Operations with Exponents**: $\dfrac{\left(4^3\right)^2}{16} =$
5. **Order of Operations**: $8 - 5 \times 2 + 9 =$	6. **Ratio and Proportion**: $\dfrac{w}{5} = \dfrac{7}{10}$ solve for w

7. Jan is making clay coasters for an art fair. Each coaster costs \$2.25 to make. If she sells the coasters for \$4.00 each, how many will she have to sell to make a profit of exactly \$70.00?
8. Four pieces of ribbon are cut from a length of ribbon that is 80 ft long. One of the pieces is 15 feet long. Two of the pieces are 7 ½ feet long. One of the pieces is 3 ¾ feet long. How many feet of ribbon are left from the original length?

9. **Percentages**: What number is 65% of 420?	10. **Scientific Notation**: Write answer in scientific notation $(2,700,000,000)(0.00003) =$

11. Amy charged \$500 worth of merchandise on her credit card. When she got her bill, which did not include any interest, she paid \$100. During the next month she charged another \$70 worth of goods. When she got her next bill she was charged 2% interest on her entire unpaid balance. How much interest was she charged?
12. A taxi cab charges \$0.80 for the first $\frac{1}{5}$ of a mile and \$0.10 for each additional $\frac{1}{10}$ of a mile. What is the cost of a 3 mile trip?
13. **Averages**:   John works a variety of different jobs. On Monday he earned \$50. Tuesday he earned \$40. On Wednesday and Thursday he earned \$30 each day, and on Friday he earned \$100. What was John's average daily pay for the 5 days?
14. **Rates**:   2½ inches per minute, 240 inches per hour, $\frac{1}{4}$ foot per minute; which is fastest?

15. **Evaluate an Expression**: Evaluate $\quad 3x^2 - 2xy + y^2$ for $x = -2$ and $y = 3$	16. **Operations with Polynomials**: $(x+y)^2 - \left(9xy - 6x^2\right) =$
17. **Multiply Polynomials**: $(2x-5)(6x+4) =$	18. **Divide Polynomials**: $\dfrac{12x^5 - 6x^3 + 4x^2}{4x^2} =$

39

19. **Factor**: $6x^3 + 27x^2 - 105x =$	20. **Simplify a Rational Expression**: $\dfrac{x^2 - 5x + 4}{x - 1} =$
21. **Simplify a Radical Expression**: $\sqrt{18x} - 4\sqrt{x^3} =$	22. **Evaluate an Expression**: $A = P(1 + r)$ If $P = \$450$ and $r = 12\%$, find A
23. **Simplify a Radical Expression**: $\sqrt[3]{27} + \sqrt[3]{64} =$	24. **Rationalize the Denominator**: $\dfrac{2 + \sqrt{3}}{2 - \sqrt{3}} =$
25. **Solve a Linear Equation**: $3x + 7 = 2(x - 1)$	26. **Solve a Quadratic Equation**: Find the sum of the solutions of $x^2 - 6x = 7$
27. **Solve an Equation w/Rational Expressions**: $\dfrac{1}{x} + \dfrac{2}{x} = 10$	28. **Solve a Linear Inequality**: $-2x + 3 < 5$
29. **Solve a System of 2 Linear Equations**: $2x + 3y = -11$ $6x + y = 7$	30. **Use Laws of Exponents**: $\dfrac{2a^{-2}}{(2a)^{-3}} =$
31. **Use Laws of Exponents**: $(2.1 \times 10^5)^2 =$	32. **Radicals and Rational Exponents**: $\sqrt[3]{a} \cdot \sqrt[4]{a} =$

33. In selling stock an investor made a profit of $160 plus 20% of the amount originally paid for the stock. If the cost of the stock was originally $800 what percent of the cost was the total profit?

34. Altogether Mark, John, and Alan earned $ 104. John earned twice as much as Mark and Alan earned $4 more that John. How much did Alan earn?

35. A train travels 4 hrs at 60 miles per hour and 2 hours at 75 miles per hour. What is the train's average rate for 6 hours?

36. **Graph a Linear Equation**: Graph $2x + y = 5$	37. **Slope**: Are these 2 lines parallel? L_1 2x + 3y = 6 L_2 line through (3, 10) (5, 7)
38. **Write the Equation of the Line**: A line goes thru $(2, -1)$ and has slope $m = 3$, what is the equation in general form?	39. **Distance Formula**: What is the distance between $A(2, -5)$ and $B(6, 3)$? (Round answer to nearest hundredth)
40. **Graph**: $y = 4 - x^2$	41. **Graph**: $x^2 + y^2 = 36$
42. **Functions**:	43. **Domain of a Function**:

$f(x) = x^2 + 2x + 3$ find $f(a+1)$	*What is the domain of* $f(x) = \dfrac{7}{2x+6}$
44. Domain of a Function: What is the domain? $f(x) = \sqrt{x-7} + 2$	**45. Range of a Function**: What is the range? $f(x) = \dfrac{1}{x-9}$ ___
46. Composite Functions: $f(x) = 3x - 2, \quad g(x) = x^2 + 1$ find $f(g(3))$ * other notation $((f \circ g)(3)$	**47. Inverse Functions**: If $h(x)$ contains the point $(4, -1)$ then h^{-1} must contain the point $(\ , \ )$
48. Complex Numbers: Leave your answer in a+bi form $\dfrac{3+2i}{3-2i}$	**49. Solve an Exponential Equation**: $9^{x+2} = \dfrac{1}{3}$
50. Logarithms: Express as a single log $2\log_a x - 3\log_a y =$	**51. Logarithms**: $\log_2 16 =$
52. Sequences: Find the 10th term of the geometric sequence 2, -6, 18, -54...	**53. Factorial**: $8! = 5! *$ _____
54. Solve a Quadratic Equation: solve using quadratic formula $x^2 + 3x + 6 = 0$	**55. Solve an Exponential Equation**: $A = P_0 10^r$ If $A = 80$, $P_0 = 90$, find r
56. A saline solution is 20% salt. How many gallons of water must be added to dilute the mixture to 8 gals of a 15% saline solution?	
57. Trigonometry: 	**58. Trigonometry**: If $\sin(x+y) = \sin x \cos y + \cos x \sin y$ Find $\sin\left(\dfrac{\pi}{2} + \alpha\right)$
59. Trigonometry: If $\sin\theta = \dfrac{5}{13}$ and $\tan\theta < 0$ then $\sec\theta =$	**60. Trigonometry**: Rewrite using only the sine function $2\cos^2 x + \sin^2 x =$

Math Practice Test Answers:

1. 73

2. $\dfrac{5}{12}$

3. 90

4. $4^4 = 256$

5. 7

6. 3.5 or 7/2

7. 40 coasters

8. 46 ¼ ft.

9. 273

10. 8.1 x 10^4

11. $9.40

12. $3.60

13. $50

14. 240 inches per hour

15. 33

16. $7x^2 - 7xy + y^2$

17. $12x^2 - 22x - 20$

18. $3x^3 - \dfrac{3}{2}x + 1$

19. $3x(2x-5)(x+7)$

20. $x - 4$

21. $3\sqrt{2x} - 4x\sqrt{x}$

22. 504

23. 7

24. $7 + 4\sqrt{3}$

25. $x = -9$

26. 6

27. $x = \dfrac{3}{10}$

28. $x > -1$

29. $x = 2,\ y = -5$

30. $2^4 a = 16a$

31. $(2.1)^2$ x 10 ^{10} or 4.41 x 10 ^{10}

32. $a^{7/12} or \sqrt[12]{a^7}$

33. 40%

34. $44

35. 65 miles per hour

36.
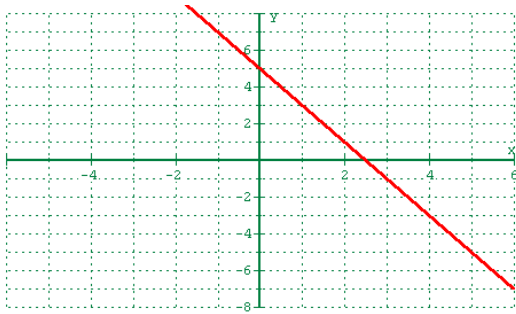
37. no

38. $3x - y = 7$

39. 8.94

40.
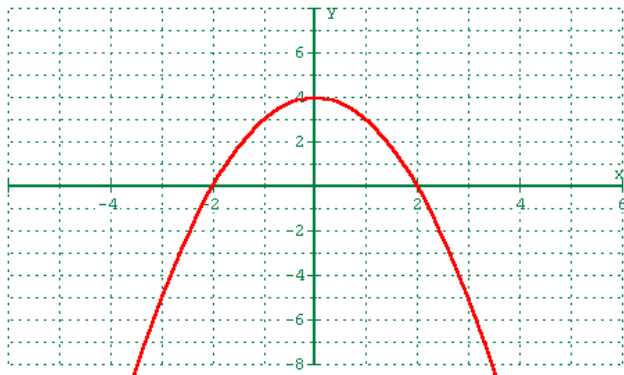
41.
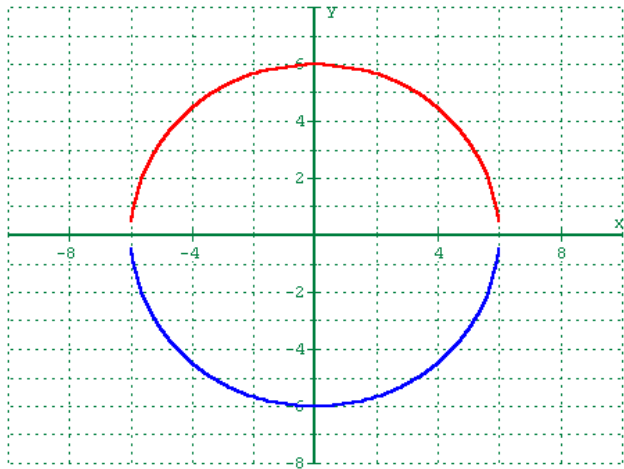
42. $a^2 + 4a + 6$

43. $x \neq -3$

44. $x \geq 7$

45. $y \neq 0$

46. 28

47. (- 1, 4)

48. $\dfrac{5}{13} + \dfrac{12}{13}i$

49. $x = \dfrac{-5}{2}$

50. $\log_a \dfrac{x^2}{y^3}$

51. 4

52. $a_n = 2 \cdot (-3)^9 \;$ or $\; -39,366$

53. $6 \cdot 7 \cdot 8$

54. $x = \dfrac{-3}{2} \pm \dfrac{\sqrt{15}}{2} i$

55. $\log \dfrac{8}{9} \;$ or $\; - .051153$

56. 2 gals of water

57. $x = \dfrac{7}{\sqrt{2}} \;$ or $\; \dfrac{7\sqrt{2}}{2}$

58. $\cos \alpha$

59. $\dfrac{-13}{12}$

60. $2 - \sin^2 x$

Section 6

Algebra
Practice

1.   What are the solutions to the quadratic equation $x^2 - 15x + 36 = 0$?

○ A. 3, 6

○ B. 6, 6

○ C. 3, 12

○ D. 4, 9

○ E. -4, -9

2.   If for all x and y, $2x - b - y = 0$, then $b = ?$

○ A. $2x - y$

○ B. $y - 2x$

○ C. $2y + x$

○ D. $2y - x$

○ E. undefined

3. For all $x \neq 4$, $\dfrac{x^2 - 8x + 16}{x - 4} = ?$

○ A. $x + 4$

○ B. $x - 4$

○ C. $x + 8$

○ D. $x - 8$

○ E. $x + 20$

4. What is the value of the expression $4x\sqrt{3x} + 5x\sqrt{8x}$ when $x = 2$?

○ A. $8\sqrt{6} + 40$

○ B. $48\sqrt{6}$

○ C.   64

○ D. $6\sqrt{5} + 7\sqrt{10}$

○ E. $166\sqrt{6}$

5. If $x \geq -1$, $4 + \sqrt{5x + 5} = 9$, then $x = ?$

○ A.   0

○ B.   4

○ C.   9

○ D. 25

○ E. no solution

6. For all $x \geq 0$ *and* $y \geq 0$, $\sqrt{250x^9 y^4} = ?$

○ A. $3x\sqrt{28y^7}$

○ B. $10x^2 y^2 \sqrt{5x^2 y}$

○ C. $5x^3 y^2 \sqrt{10}$

○ D. $5x^4 y^2 \sqrt{10x}$

○ E. $5x^3 y^2 \sqrt{3}$

7. If the ratio of 4 to b is 5 to 7 then $b = ?$

○ A. 3

○ B. $\dfrac{28}{5}$

○ C. $\dfrac{35}{4}$

○ D. 16

○ E. $\dfrac{20}{7}$

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8. Simplify $\left(\dfrac{a^5}{b^2}\right)^3$

○ A. $\dfrac{a^8}{b^5}$

○ B. $\dfrac{a^{15}}{b^6}$

○ C. $\dfrac{a^{128}}{b^8}$

○ D. $\dfrac{3a^5}{b^2}$

○ E. $\dfrac{a^{\frac{5}{3}}}{b^{\frac{2}{3}}}$

9. Simplify $\dfrac{\sqrt{32}}{2} + \dfrac{2\sqrt{3}}{3} = ?$

○ A. $4 + 2\sqrt{3}$

○ B. $\dfrac{6\sqrt{2} + 2\sqrt{3}}{3}$

○ C. 6

○ D. $4 + \dfrac{2\sqrt{3}}{3}$

○ E. $\dfrac{2\sqrt{35}}{5}$

10. Which equation best describes this graph?

○ A. $y = -x^2 - 2x - 3$
○ B. $y = -x^2 + 2x + 3$
○ C. $y = -x^2 - 2x + 3$
○ D. $y = -x^2 - 6x + 3$
○ E. $y = -x^2 + 3x - 4$

(-1, 4)
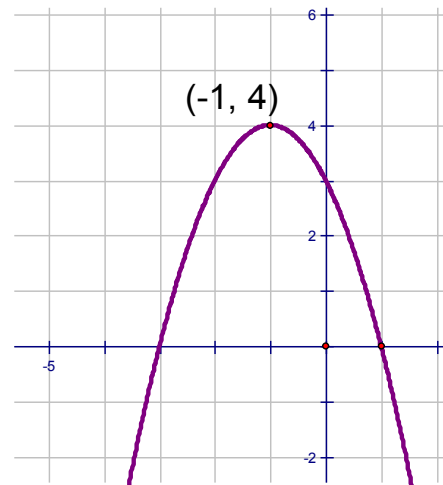
11. For all B and C and $A \neq 0$, if $Ax + B = C$ then $x = ?$

○ A. $\dfrac{B - A}{C}$

○ B. $\dfrac{A - B}{C}$

○ C. $\dfrac{AB}{C}$

○ D. $\dfrac{C - B}{A}$

○ E. $\dfrac{C - A}{B}$

12. Simplify $\dfrac{\sqrt{32}}{3} + \dfrac{\sqrt{18}}{5}$.

○ A. $\dfrac{\sqrt{50}}{8}$

○ B. $\dfrac{5\sqrt{2}}{8}$

○ C. $\dfrac{5\sqrt{2}}{3}$

○ D. $\dfrac{29\sqrt{2}}{15}$

○ E. $\dfrac{\sqrt{2}}{3}$

48

13. If 25 is subtracted from the square of a certain number b the result is 11. Which of the following equations determines the correct value of b?

O A. $b^2 = 25 - 11$

O B. $b^2 = 11 - 25$

O C. $b - 5 = 121$

O D. $25 - b^2 = 11$

O E. $b^2 - 25 = 11$

14. For all x, $(3x^2 + 5x + 7) - (2x^2 - 3x + 10) = ?$

O A. $x^2 + 8x - 3$

O B. $x^2 + 2x - 3$

O C. $x^2 + 8x + 17$

O D. $5x^2 + 8x + 17$

O E. $5x^2 - 2x - 3$

15 If the reciprocal of a certain number x is added to $\dfrac{5}{3}$ the result is 2. What is x?

O A. 1

O B. 2

O C. 3

O D. -2

O E. -3

16. Find the value of $2x\sqrt{18x} + 3x\sqrt{2x}$ when $x = 2$.

O A. 12

O B. 24

O C. 36

O D. 48

O E. 60

17. Which equation best describes this graph?

O A. $y = x^2 - 6x + 5$

O B. $y = x^2 + 6x + 5$

O C. $y = x^2 - 6x - 5$

O D. $y = x^2 + 6x - 5$

O E. $y = x^2 + 3x - 4$

(0, 5)

(3, -4)

18 In the standard rectangular coordinate plane find the distance between (-3, 4) and (2 , -8).

O A. 12

O B. 13

O C. 25

O D. 144

O E. 169

19 For all x, $(3x-5)^2 = ?$ ○ A. $9x^2 + 25$ ○ D. $9x^2 + 15x + 25$

○ B. $9x^2 - 25$ ○ E. $9x^2 - 30x + 25$

○ C. $9x^2 - 15x + 25$

20 For all a,b $(a+3b)^2 - 3b(2a+3b) = ?$

○ A. $a^2 - 6ab$ ○ D. $2a^2 - 6ab + 18b$

○ B. $a^2 - 18b^2$ ○ E. a^2

○ C. $a^2 - 6ab + 18b^2$

21. For $x = 2$, $x\sqrt{2x} + 3\sqrt{8x} + 5\sqrt{3x} = ?$

○ A. $10\sqrt{26}$ ○ D. $5\sqrt{20} + 5\sqrt{6}$

○ B. $21\sqrt{6}$ ○ E. 31

○ C. $16 + 5\sqrt{6}$

22.   If $x = -2$ and $y = 5$, what is the value of the expression $2x^3 - 3xy$?

○ A. 14   ○ B. 46   ○ C. 54   ○ D. -46   ○ E. -54

23.   What are the solutions to the quadratic equation $x^2 - 2x = 48$?

○ A. -12, -4   ○ D. -6, 8

○ B. -8, -6   ○ E. -8, 6

○ C. 6, 8

24.   For all x ≠ ±3, $\dfrac{x^2 - 7x + 12}{x^2 - 9} = ?$

○ A. $\dfrac{x+4}{x-3}$ ○ B. $\dfrac{x+4}{x+3}$ ○ C. $\dfrac{x-4}{x-3}$ ○ D. $\dfrac{x-4}{x+3}$ ○ E. $\dfrac{-7x+12}{-9}$

25.   Which is the complete factorization of $5y^3 - 125y$?

○ A. $y(5y^2 - 25)$ ○ C. $5y(y+5)(y-5)$ ○ E. $5y(y+5)^2$

○ B. $5y^2(y-25)$ ○ D. $5y(y+5)^2$

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Special COMPASS Practice 2004 Answers (don't peak)

1. C
2. A
3. B
4. A
5. B
6. D
7. B
8. B
9. B
10. C
11. D
12 D
13. E
14. A
15. C
16. C
17. A
18. B
19. E
20. E
21 C
22 A
23 D
24. D
25. C

PowerPoint with solutions worked out available at:
http://www.highlands.edu/site/academic-support-compass-math-practice

COMPASS Math Practice A   Name _____

Answers at the end. Solutions can be found on the web site.
http://www.highlands.edu/site/academic-support-compass-math-practice

A1.   If x = -2 and y = 5, what is the value of the expression $2x^3 - 3xy$?

○ A. 14   ○ B. 46   ○ C. 54   ○ D. -46   ○ E. -54

A2.   What are the solutions to the quadratic equation $x^2 - 2x = 48$?

○ A. -12, -4   ○ B. -8, -6   ○ C. 6, 8   ○ D. -6, 8   ○ E. -8, 6

A3.   Rationalize the denominator. $\sqrt{\dfrac{4}{3}}$

○ A. $\dfrac{2}{3}$ ○ B. $\dfrac{2\sqrt{3}}{3}$ ○ D. $\dfrac{2}{9}$

○ C. 4   ○ E. $\dfrac{\sqrt{6}}{9}$

A4.   What is the equation of the line that contains the points (-1, 1) and (2 , 7)?

○ A. $y = 5x + 3$ ○ D. $y = 2x + 5$

○ B. $y = 3x + 3$ ○ E. $y = 2x + 3$

○ C. $y = \dfrac{3}{4}x + 5$

A5.   For all x ≠ ±3, $\dfrac{x^2 - 7x + 12}{x^2 - 9} = ?$

○ A. $\dfrac{x+4}{x-3}$ ○ C. $\dfrac{x-4}{x-3}$ ○ E. $\dfrac{-7x+12}{-9}$

○ B. $\dfrac{x+4}{x+3}$ ○ D. $\dfrac{x-4}{x+3}$

53

A6.   Which is the complete factorization of $5y^3 - 125y$?

○ A. $y(5y^2 - 25)$ ○ D. $5y(y + 5)^2$

○ B. $5y^2(y - 25)$ ○ E. $5y(y - 5)^2$

○ C. $5y(y + 5)(y - 5)$

A7.   What is the product of $(4\sqrt{2} - 5\sqrt{5})$
        and $(\sqrt{2} - 3\sqrt{5})$?

○ A. $6\sqrt{2} - 8\sqrt{5}$ ○ D. $74\sqrt{10}$

○ B. $-3\sqrt{3}$ ○ E. $40 - 13\sqrt{10}$

○ C. $83 - 17\sqrt{10}$

A8.   If $3\frac{1}{2}x = 8$,   then $x = ?$

○ A. $\frac{9}{2}$ ○ C. $2\frac{2}{7}$ ○ E. $11\frac{1}{2}$

○ B. $\frac{2}{9}$ ○ D. $\frac{7}{16}$

A9.   If, $x = \frac{1}{3}$ what is the value of the expression $9x^2 - 6x + 15$?

○ A. 12   ○ B. 14   ○ C. 17   ○ D. 22   ○ E. 36

A10. For all $b \neq 0$, $\dfrac{8b^2 + 16b}{4b} = \ldots$

○ A. $18b$ ○ C. $32b^2 + 48b$ ○ E. $2b + 4$

○ B. $6b$ ○ D. $2b^2 + 4b$

1. A 2. D   3. B   4. E   5. D   6. C 7. C 8. C 9. B   10. E

Name _____

Answers at the end. Solutions can be found on the web site. http://www.highlands.edu/site/academic-support-compass-math-practice

B1.   Which of these is the product of (x + 2y) and (2x − 3y) ?

O A. $2x^2 - 7xy + 6y^2$

O B. $2x^2 + xy - 6y^2$

O C. $2x^2 + 7xy + 6y^2$

O D. $2x^2 - xy - 6y^2$

O E. $2x^2 + 7xy - 6y^2$

B2.   For all $a \neq o$ and $b \neq 0$, $\dfrac{4a}{\frac{1}{ab}} = ?$

O A. $4a^2 b$

O B. $\dfrac{4}{b}$

O C. $\dfrac{ab}{4a}$

O D. $\dfrac{b}{4}$

O E. $\dfrac{1}{4a^2 b}$

B3.   This is a graph of which equation?

O A. $y = -\dfrac{2}{3}x + 6$

O B. $y = \dfrac{3}{2}x + 6$

O C. $y = \dfrac{2}{3}x - 6$

O D. $y = -\dfrac{3}{2}x + 6$

O E. $y = -\dfrac{3}{2}x - 6$
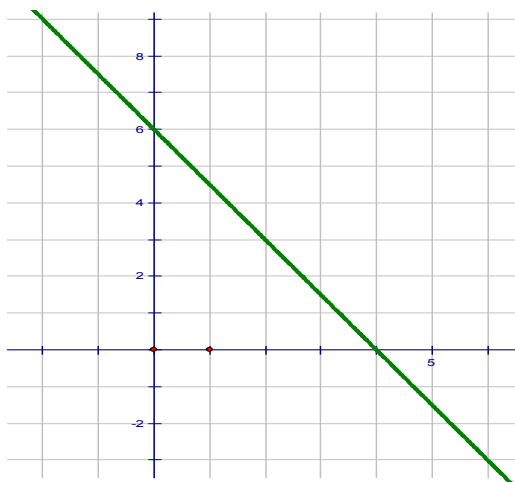
B4.   What is the solution to the equation $3(x + 2) - 2(2x + 2) = -2$?

O A.   -12   O B.   10   O C.   -4   O D.   4   O E.   12

B5.   In the Cartesian plane what is the distance between the points $(4, 2\sqrt{13})$ and $(-2, \sqrt{13})$?

O A. $6 + \sqrt{13}$

O B. $9\sqrt{13}$

O C.   75

O D.   49

O E.   7

55

B6. Simplify: $25^{-\frac{3}{2}}$

○ A. $\frac{1}{15}$

○ D. $\frac{1}{125}$

○ B. $\frac{1}{75}$

○ E. -125

○ C. -375

B7. What is the distance from point A to point B?
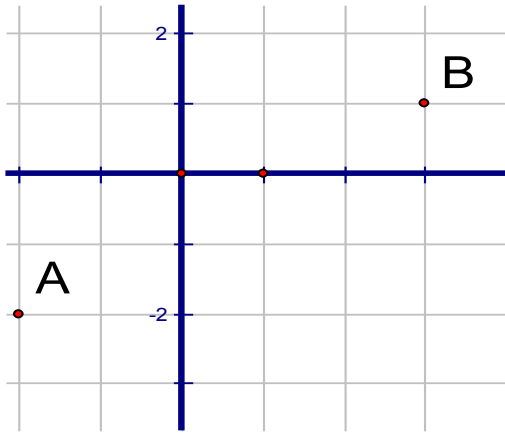
○ A.   8

○ B.   34

○ C. $2\sqrt{2}$

○ D. $\sqrt{34}$

○ E. $\sqrt{75}$

B8.   For all $x \neq 0$ and $y \neq 0$, $\dfrac{x^{-4}y^3}{x^6 y^{-5}}$

○ A. $\dfrac{x^5}{y^4}$

○ C. $x^2 y^2$

○ E. $\dfrac{1}{x^2 y^2}$

○ B. $\dfrac{y^8}{x^{10}}$

○ D. $\dfrac{x^{10}}{y^8}$

B9.   For all x, y, and z, $(x^3 y^2 z)^2$

○ A. $x^5 y^4 z^2$

○ D. $x^5 y^4 z^3$

○ B. $x^6 y^4 z^2$

○ E. $2x^3 y^2 z$

○ C. $x^9 y^4 z^2$

B10. If $y = 2x^2 - 5x + 12$ and $x = -3$, then $y = ?$

○ A.   45

○ B.   64   ○ C.   30   ○ D.   9   ○ E.   15

1. B   2. A   3. D   4. D   5. E   6. D   7. D   8. B   9. B   10. A

COMPASS Math Practice C　　　　　　　　Name _____

Answers at the end. Solutions can be found on the web site.
http://www.highlands.edu/site/academic-support-compass-math-practice

C1. If x = -2 and y = -3, what is the value of the expression $4x^3 - 2xy$?

○ A. 36　　　○ B. 20　　　○ C. -20　　　○ D. −36　　　○ E. -44

C2. Which of the following expressions represents the product of four more than twice x and six less than x?

○ A. $x^2 - 4x - 12$　　　　　　　○ D. $2x^2 + 16x + 24$

○ B. $2(x^2 - 4x - 12)$　　　　　　○ E. $2x^2 - 16x - 24$

○ C. $8x^2 - 48x$

C3. A student earned scores of 85, 76, and 78 on three of four tests. What must the student score on the fourth test to have an average (arithmetic mean) of exactly 80?

○ A. 79　　　○ B. 80　　　○ C. 81　　　○ D. 82　　　○ E. 83

C4. Which of the following is an equation of the line that contains the points (2, 3) and (4 , 6)?

○ A. $y = \dfrac{-3}{2}x$ 　　　　　　　○ D.　　　　$y = \dfrac{2}{3}x$

○ B.　$y = \dfrac{3}{2}x$ 　　　　　　　○ E.

　　　　　　　　　　　　　　　　　　　$y = \dfrac{2}{3}x + 6$

○ C.　$y = \dfrac{3}{2}x + 6$

C5. For all $x \ne \pm 6$,　　　$\dfrac{x^2 - x - 30}{x^2 - 36} = ?$

○ A. $\dfrac{x+5}{x-6}$ 　　　　　　　　○ D. $\dfrac{x+5}{x+6}$

○ B. $\dfrac{x+6}{x-6}$ 　　　　　　　　○ E. $\dfrac{x-5}{x-6}$

○ C. $\dfrac{x-5}{x+6}$

C6. Each circle has a diameter of 6. What is the location of point B the center of the bottom circle?

○ A. (6 –15)

○ B. (6, -18)

○ C. (3, -15)

○ D. (3, -18)

○ E. (1, -3)
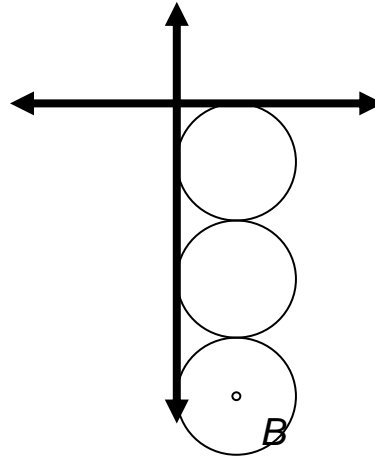
C7. For all x, $(x^2 + 3x + 9)(x - 3)$ is
○ A. $x^3 + 3x^2 - x - 3$
○ B. $x^2 + 2x - 3$
○ C. $3x - 3$
○ D. $x^3 - 27$
○ E. $x^3 - x^2 + 3x - 3$

C8. If $A \circ B = 2A + 3B$, find $4 \circ 5$
○ A. 20
○ B. 23
○ C. 17
○ D. 9
○ E. 5

C9. What is the perimeter of $\triangle ABC$?
○ A. 8
○ B. 10
○ C. 14
○ D. 24
○ E. 28

C10. What is the value of $64^{2/3}$?

○ A. 4
○ B. 16
○ C. 21.3
○ D. 96
○ E. $\dfrac{128}{3}$

1E 2B 3C 4B 5D 6C 7D 8B 9D 10B

COMPASS Math Practice D   Name _____

Answers at the end. Solutions can be found on the web site.

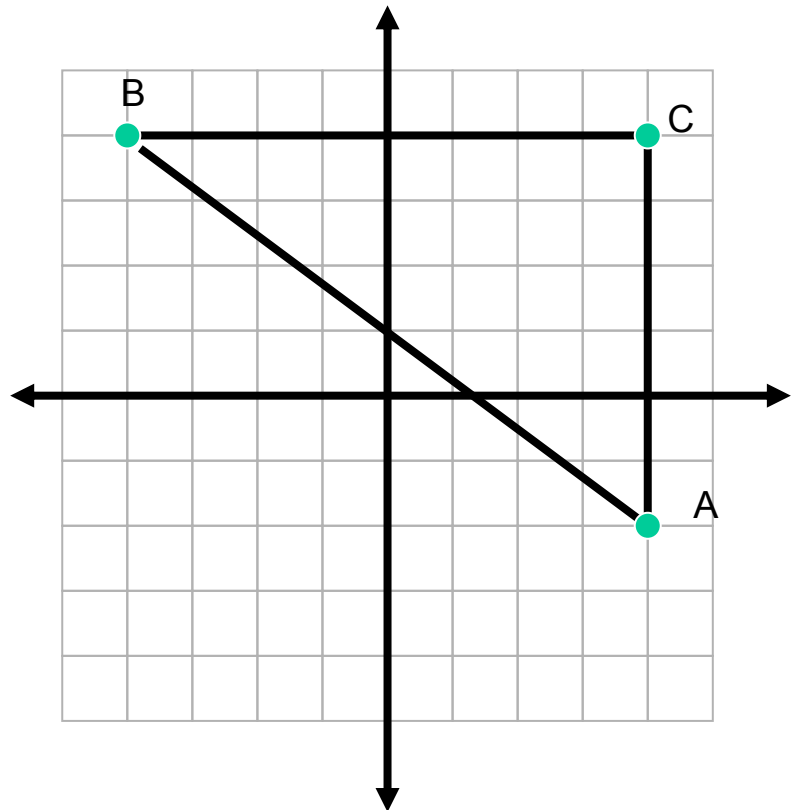D1. If $x = -1$ and $y = -2$, what is the value of the expression $2x^2y - 3xy$?

A.   -24
B.   -10
C.   -2
D.   2
E.   10

D2. What are the solutions to the quadratic $x^2 - 2x - 48 = 0$?

A. 6 and 8
B. -6 and -8
C. -6 and 8
D. 6 and -8
E. 3 and 16

D3. What is the sum of the solutions to the quadratic $x^2 - 2x - 48 = 0$?

A. 14
B. -14
C. 2
D. -2
E. 19

D4. What is the sum of the solutions of the quadratic equation $x^2 + 3x = 28$?

A. 3
B. -3
C. 11
D. -11
E. 10

D5. What is the sum of the solutions of the quadratic equation $2x^2 - x = 15$?

A. $\dfrac{1}{2}$ B. $\dfrac{-1}{2}$ C. $\dfrac{-11}{2}$ D. $\dfrac{11}{2}$ E. -1

D6. If the equation $x^2 - x = 6$ is solved for x, what is the sum of the solutions?

A. 3
B. 2
C. 5
D. 1
E. -1

D7. What are the solutions to the quadratic $x^2 - 5x = -6$?

A. -2, -3
B.   2, 3
C.   1, 6
D. -1, -6
E. -2, 3

D8. For all x ≠ $\dfrac{x^2 - 5x + 6}{x - 2} = ?$ 2,

A. (x + 5)
B. (x - 2)
C. (x + 2)
D. (x - 3)
E. (x + 3)

D9. If x = -4 is a solution to the equation $x^2 + 11x + K = 0$, then $K = ?$

A. 16
B. 28
C. -28
D. 60
E. -60

D10. What are the solutions to the quadratic $x^2 - 10x + 24 = 0$?

A. 4 and 6
B. -4 and 6
C. -4 and -6
D. 2 and -12
E. -2 and 12

1B 2C 3C 4B 5A 6D 7B 8D 9B 10A

E1. What is the value $\dfrac{x^2+2x-24}{x+2}$ of　when x = -5?

○ A.　$\dfrac{9}{8}$　　　○ B.　$\dfrac{11}{8}$　　　○ C.　$\dfrac{-11}{3}$　　　○ D. -3　　○ E. 3

E2. Simplify　$\dfrac{\sqrt{50}}{3}+\dfrac{5\sqrt{3}}{6}$

○ A.　$\dfrac{5\sqrt{2}}{3}+\dfrac{5}{2}$　○ B.　$\dfrac{5\sqrt{6}}{2}$　○ C.　$\dfrac{5\sqrt{53}}{6}$　○ D.　$\dfrac{10\sqrt{2}}{3}$　○ E.　$\dfrac{10\sqrt{2}+5\sqrt{3}}{6}$

E3. In the figure below what is the distance between point A and B?

○ A. 11

○ B. 10

○ C. $\sqrt{11}$

○ D. 9

○ E. $\sqrt{65}$
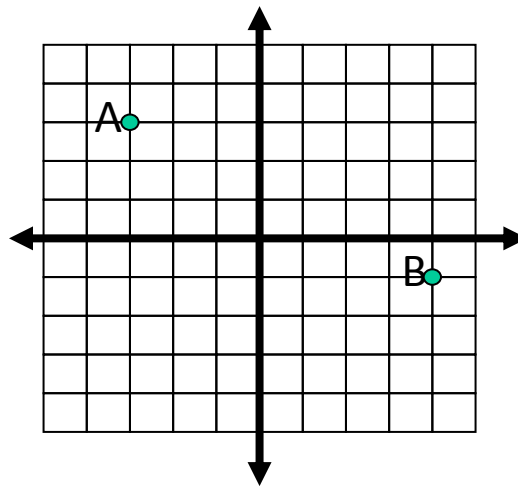
E4.　In the standard coordinate plane what is the distance between (-5, 2) and (1, -6)?

○ A. 9　　　○ B. 10　　○ C. $\sqrt{11}$　　　○ D. 14　　　○ E. $\sqrt{14}$

E5. 27 $^{-2/3}$ = ?

○ A. −18　　　○ B. $\dfrac{1}{18}$　　　○ C. 9　　○ D. $\dfrac{-1}{9}$　　　○ E. $\dfrac{1}{9}$

E6. The parabola below is a graph of which equation?

○ A. $y = (x - 2)^2 + 4$

○ B. $y = (x + 2)^2 + 4$

○ C. $y = -(x - 2)^2 + 4$

○ D. $y = -(x + 2)^2 + 4$

○ E. $y = x^2 + 4x + 8$

(-2, 4)

(-4, 0)   (0, 0)
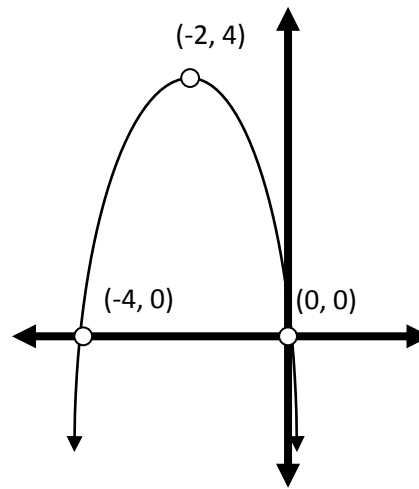
E7. The solution of the equation below falls between what two integers?
   2x + 8 = 7x + 20

○ A. -4 and -3   ○ B. -3 and -2   ○ C. -2 and -1   ○ D. 1 and 2   ○ E. 2 and 3

E8. What is the solution of the system of equations below?

○ A. (3a, 2a)
○ B. (-3a, 2a)
○ C. (15a, 11a)
○ D. (15a, -11a)
○ E. (3a, -2a)

$$3x + 4y = a$$
$$2x - 4y = 14a$$

E9. What is the slope of the line in the standard coordinate plane determined by the equation 2x - 3y = 12?

○ A. $\dfrac{3}{2}$ ○ D. $\dfrac{-2}{3}$

○ B. $\dfrac{-3}{2}$ ○ E. -4

○ C. $\dfrac{2}{3}$

E10. For all x and y, $(x + 2y)^2 - 4y(x + y) = ?$

○ A. x^2 ○ B. $x^2 - 4xy$ ○ C. $x^2 - 2xy$ ○ D. $x^2 + 8y^2$ ○ E. $(x + 4y)(x - 4y)$

Answers at the end. Solutions can be found on the web site.
http://www.highlands.edu/site/academic-support-compass-math-practice

F1 Which equation best describes the data in this table?

X	0	2	-2
Y	5	1	9

○ A. y = 4x – 7   ○ B. y = x – 6   ○ C. y = -2x + 5   ○ D. y = 4x + 3   ○ E. y = 3x + 5

F2   For all x, $\dfrac{20}{\sqrt{x^2 + 7}} = 5$ $x^2 = ?$

○ A. 9   ○ B. 3   ○ C. 16   ○ D. 7   ○ E. 4

F3 $\dfrac{\sqrt{48}}{3} + \dfrac{5\sqrt{5}}{6} =$

○ A. $\dfrac{13\sqrt{8}}{6}$ ○ D. $\dfrac{9\sqrt{8}}{9}$

○ B. $\sqrt{8}$ ○ E. $4 + \dfrac{5\sqrt{5}}{6}$

○ C. $\dfrac{8\sqrt{3} + 5\sqrt{5}}{6}$

F4   What is the slope of 3x + 2y = 6?

○ A. 3   ○ B. $\dfrac{-2}{3}$ ○ C. $\dfrac{2}{3}$ ○ D. $\dfrac{3}{2}$ ○ E. $\dfrac{-3}{2}$

F5   Which of these equations defines a line that is perpendicular to the line given by the equation y = 2x + 5?

○ A. $y = \dfrac{1}{2}x + 5$ ○ D. $y = \dfrac{-1}{2}x + 5$

○ B. $y = \dfrac{1}{5}x + 2$ ○ E. $y = \dfrac{-1}{5}x + 2$

○ C. $y = \dfrac{2}{5}x + 1$

F6   In the standard (x, y) plane, what is the distance between $(3\sqrt{5},0)$ and $(6\sqrt{5},4)$?

O A. 45   O B. 16   O C. $\sqrt{61}$ O D. 61   O E. $\sqrt{29}$

F7   What are the (x, y) coordinates of the point of intersection of the lines determined by the equations 2x – 3y = 4 and y = x?

O A. (4, 4) O B. (–4, –4)   O C. (–4, 4)   O D. (4, –4)   O E. (2, 0)

F8   If ⊗ is a special operation defined by (a ⊗ b) = 3a – 2b and (6 ⊗ x) = 8 then x = ?

O A. 2   O B. 3   O C. 4   O D. 5   O E. 6

F9 $12x^2$ + 11x – 36 is the product of (3x – 4) and another polynomial. What is the other polynomial?

O A. 9x – 4   O B. $4x^2$ O C. $4x^2$ + 9   O D. 4x – 9   O E. 4x + 9

F10 $\sqrt[4]{\dfrac{16}{81}}$

O A. $\dfrac{4}{9}$ O B. $\dfrac{2}{9}$ O D. $\dfrac{2}{\sqrt[4]{9}}$ O C. $\dfrac{2}{3}$ O E. $\dfrac{4}{20.25}$

1C   2A   3C   4E   5D   6C   7B   8D   9E   10C

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Answers at the end. Solutions can be found on the web site.
 http://www.highlands.edu/site/academic-support-compass-math-practice

G1.   For all B and C and A ≠ 0, if $Ax + B = C$ then $x = ?$

○ A. $\frac{B-A}{C}$ ○ B. $\frac{A-B}{C}$ ○ C. $\frac{AB}{C}$ ○ D. $\frac{C-B}{A}$ ○ E. $\frac{C-A}{B}$

G2. Simplify $\dfrac{\sqrt{32}}{3} + \dfrac{\sqrt{18}}{5}$

○ A. $\frac{\sqrt{50}}{8}$ ○ D. $\frac{29\sqrt{2}}{15}$

○ B. $\frac{5\sqrt{2}}{8}$ ○ E. $\frac{\sqrt{2}}{3}$

○ C. $\frac{5\sqrt{2}}{3}$

G3. If 25 is subtracted from the square of a certain number b the result is 11. Which of the following
     equations determines the correct value of b?

○ A. $b^2 = 25 - 11$
○ B. $b^2 = 11 + 25$
○ C. $b - 5 = 121$
○ D. $25 - b^2 = 11$
○ E. $b^2 - 25 = 11$

G4. For all x, $(3x^2 + 5x + 7) - (2x^2 - 3x + 10) = ?$
○ A. $x^2 + 8x - 3$
○ B. $x^2 + 2x - 3$
○ C. $x^2 + 8x + 17$
○ D. $5x^2 + 8x + 17$
○ E. $5x^2 - 2x - 3$

G5. If the reciprocal of a certain number x is added to $\frac{5}{3}$ the result is 2. What is x?

○ A. 1
○ B. 2
○ C. 3
○ D. −2
○ E. −3

G6. Find the value of $2x\sqrt{18x} + 3x\sqrt{2x}$ when $x = 2$.

○ A. 12
○ B. 24
○ C. 36
○ D. 48
○ E. 60

G7. Which equation best describes this graph?

○ A. $y = x^2 - 6x + 5$
○ B. $y = x^2 + 6x + 5$
○ C. $y = x^2 - 6x - 5$
○ D. $y = x^2 + 6x - 5$
○ E. $y = x^2 + 3x - 4$

(0, 5)

(3, -4)
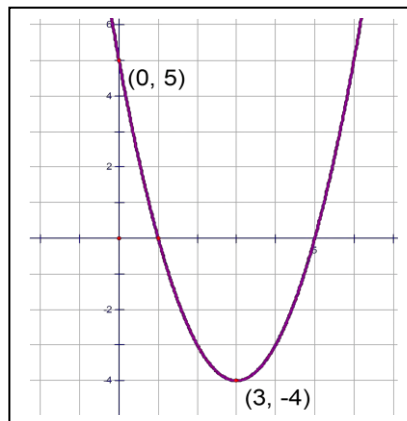
G8 In the standard rectangular coordinate plane find the distance between (-3, 4) and (2 , -8).

○ A. 12
○ B. 13
○ C. 25
○ D. 144
○ E. 169

G9 For all x, $(3x-5)^2 = ?$

○ A. $9x^2 + 25$
○ B. $9x^2 - 25$
○ C. $9x^2 - 15x + 25$
○ D. $9x^2 + 15x + 25$
○ E. $9x^2 - 30x + 25$

G10. For all a, b $(a+3b)^2 - 3b(2a+3b) = ?$

○ A. $a^2 - 6ab$
○ B. $a^2 - 18b^2$
○ C. $a^2 - 6ab + 18b^2$
○ D. $2a^2 - 6ab + 18b$
○ E. a^2

1.D   2. D   3. E   4. A   5. C   6. C   7. A   8. B   9. E   10. E

Answers at the end. Solutions can be found on the web site. http://www.highlands.edu/site/academic-support-compass-math-practice

H1.   What are the solutions to the quadratic equation $x^2 - 15x + 36 = 0$?
○ A. 3, 6   ○ C. 3, 12   ○ E. -4, -9
○ B. 6, 6   ○ D. 4, 9

H2.   If for all x and y, $2x - b - y = 0$, then $b = ?$

○ A. $2x - y$ ○ C. $2y + x$ ○ E. undefined
○ B. $y - 2x$ ○ D. $2y - x$

H3. For all $x \neq 4$, $\dfrac{x^2 - 8x + 16}{x - 4} = ?$

○ A. $x + 4$ ○ D. $x - 8$
○ B. $x - 4$ ○ E. $x + 20$
○ C. $x + 8$

H4. What is the value of the expression $4x\sqrt{3x} + 5x\sqrt{8x}$ when $x = 2$?

○ A. $8\sqrt{6} + 40$ ○ D. $6\sqrt{5} + 7\sqrt{10}$
○ B. $48\sqrt{6}$ ○ E. $166\sqrt{6}$
○ C. 64

H5. If $x \geq -1$, $4 + \sqrt{5x + 5} = 9$, then $x = ?$

○ A. 0   ○ C. 9   ○ E. no solution
○ B. 4   ○ D. 25

H6. For all $x \geq 0$ and $y \geq 0$ $\sqrt{250x^9 y^4} = ?$

○ A. $3x\sqrt{28y^7}$ ○ D. $5x^4 y^2 \sqrt{10x}$
○ B. $10x^2 y^2 \sqrt{5x^2 y}$ ○ E. $5x^3 y^2 \sqrt{3}$
○ C. $5x^3 y^2 \sqrt{10}$

H7. Simplify $\left(\dfrac{a^5}{b^2}\right)^3$

○ A. $\dfrac{a^8}{b^5}$ ○ C. $\dfrac{a^{128}}{b^8}$ ○ E. $\dfrac{a^{\frac{5}{3}}}{b^{\frac{2}{3}}}$

○ B. $\dfrac{a^{15}}{b^6}$ ○ D. $\dfrac{3a^5}{b^2}$

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H8. Simplify $\dfrac{\sqrt{32}}{2} + \dfrac{2\sqrt{3}}{3} = ?$

○ A. $4 + 2\sqrt{3}$

○ B. $\dfrac{6\sqrt{2}+2\sqrt{3}}{3}$

○ C. 6

○ D. $4 + \dfrac{2\sqrt{3}}{3}$

○ E. $\dfrac{2\sqrt{35}}{5}$

H9. If the ratio of 4 to b is 5 to 7 then b = ?

○ A. 3

○ B. $\dfrac{28}{5}$

○ C. $\dfrac{35}{4}$

○ D. 16

○ E. $\dfrac{20}{7}$

H10. Which equation best describes this graph?

(-1, 4)

○ A. $y = -x^2 - 2x - 3$
○ B. $y = -x^2 + 2x = 3$

○ C. $y = -x^2 - 2x + 3$
○ D. $y = -x^2 - 6x + 3$

○ E. $y = -x^2 + 3x - 4$

1. C   2. A   3. B   4. A   5. B   6. D   7. B   8. B   9. B   10. C

COMPASS Math Practice J   Name _____
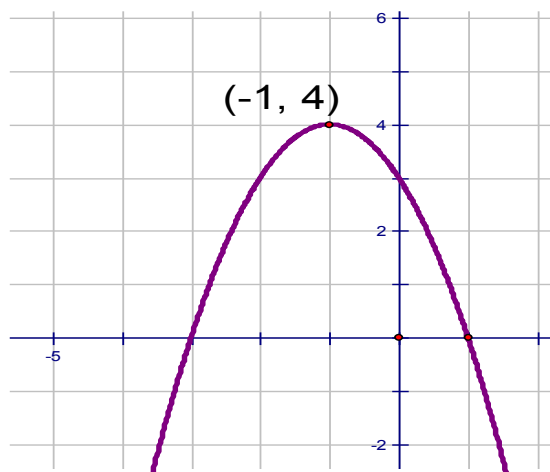
Answers at the end. Solutions can be found on the web site.

J1 Which equation best describes the data in this table?

X	-3	0	3
Y	-6	-4	-2

○ A. 2X + Y = -12   ○ D. 2Y = 3X + 12
○ B. 2X = – 6   ○ E. -3X + Y = -8
○ C. 2X – 3Y = 12

J2   For all x, $\dfrac{18}{\sqrt{x^2+4}}=6$ $x^2 = ?$

○ A. 9   ○ B. 3   ○ C. 5   ○ D. 7   ○ E. 4

J3 $\dfrac{\sqrt{18}}{2}+\dfrac{\sqrt{32}}{3}=$

○ A. $\sqrt{2}$ ○ D. $\dfrac{14}{5}$

○ B. $5\sqrt{10}$ ○ E. $\dfrac{17\sqrt{2}}{6}$

○ C. $\dfrac{9\sqrt{6}+4\sqrt{2}}{6}$

J4   For all a ≠ b, $\dfrac{\dfrac{5a}{b}}{\dfrac{2a}{a-b}}=?$

○ A. $\dfrac{10a^2}{ab-b^2}$ ○ B. $\dfrac{5(a-b)}{2b}$ ○ C. $\dfrac{2b}{5(a-b)}$ ○ D. $\dfrac{5b}{2(a-b)}$ ○ E. $\dfrac{ab-b^2}{10a^2}$

J5   Which of these equations defines a line that is parallel to the line given by the equation y = -0.5x + 5?

○ A. $y=\dfrac{1}{2}x-5$ ○ D. $y=\dfrac{-1}{2}x+7$

○ B. $y=\dfrac{1}{5}x+2$ ○ E. $y=\dfrac{-1}{5}x+2$

○ C. $y=\dfrac{2}{5}x+1$

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J6   In the standard (x, y) plane, what is the distance between $(3\sqrt{3}, -1)$ and $(6\sqrt{3}, 2)$?

O A. 6   O B. 9   O C. $3\sqrt{3}$ O D. 27   O E. $9 + 9\sqrt{3}$

J7   What is the solution of the system of equations below?

O A. (3a, 2a) $x + 2y = 7a$
O B. (-3a, 2a) $3x - 2y = 5a$
O C. (a, 2a)
O D. (5a, -a)
O E. (3a, -2a)

J8   For all x, $(x - 3)^2 + 3(2x - 3) = ?$

O A. x^2
O B. $x^2 - 12x$
O C. $x^2 - 6x$
O D. $x^2 + 12x + 18$
O E. $x^2 - 12x + 18$

J9 $8^{-2/3} = ?$

O A. −4   O D. $\dfrac{-16}{3}$

O B. $\dfrac{-1}{4}$ O E. $\dfrac{1}{4}$

O C. 4

J10. What is the value of k when $\dfrac{x^2 - kx + 24}{x - 12} = x - 2$?

O A. 10   O B. -10   O C. 14   O D. -14   O E. 2

1C   2C   3E   4B   5D   6A   7A   8A   9E   10C

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COMPASS Math Practice K   Name _____

Answers at the end. Solutions can be found on the web site.
http://www.highlands.edu/site/academic-support-compass-math-practice

K1.   If x = -1 and y = 3, what is the value of the expression $3x^3 - 2xy$?

O A.   -9   O B.   -3   O C.   3   O D.   9   O E.   21

K2.   Which of the following expressions represents the product of three less than x and five
       more than twice x ?

O A. $2x^2 + 11x + 15$ O D. $2x^2 - x - 15$
O B. $2x^2 - 11x + 15$ O E. $2x^2 + 22x + 15$
O C. $2x^2 + x - 15$

K3.   A student earned scores of 83, 78, and 77 on three of four tests. What must the student
       score on the fourth test to have an average (arithmetic mean) of exactly 80?

O A.   80   O D.   85
O B.   82   O E.   86
O C.   84

K4.   What is the equation of the line that contains the points (2, 3) and (14 , - 6)

O A. $y = \dfrac{-3}{4}x + 5$ O D. $y = \dfrac{-4}{3}x + \dfrac{17}{3}$

O B. $y = \dfrac{-3}{4}x + \dfrac{9}{2}$ O E. $y = \dfrac{-1}{2}x + \dfrac{5}{2}$

O C. $y = \dfrac{3}{4}x + 5$

K5.   For all x ≠ ±4, $\dfrac{x^2 - x - 20}{x^2 - 16} = ?$

O A. $\dfrac{x+5}{x-4}$ O D. $\dfrac{x+5}{x+4}$

O B. $\dfrac{x+4}{x+4}$ O E. $\dfrac{x-5}{x-4}$

O C. $\dfrac{x-5}{x+4}$

K6.   A rope 36 feet long is cut into three pieces, the second piece is four feet longer than the

first, the last piece is three times as long as the second. If x represents the length of the first piece, then which equation determines the length of the first piece?

- A. $36 = 5x + 8$
- B. $36 = x + (x + 4) + (3x)$
- C. $36 = 3x + 12$
- D. $36 = x + (x + 4) + 3(x + 4)$
- E. $36 = 3x + 16$

K7.   The product $(x^2 + 3)(x - 1)$ is

- A. $x^3 + 3x^2 - x - 3$
- B. $x^2 + 2x - 3$
- C. $3x - 3$
- D. $x^3 - 3$
- E. $x^3 - x^2 + 3x - 3$

K8.   If n is an integer which expression must be an even integer?

- A. $2n + 1$
- B. $2n - 1$
- C. $n + 1$
- D. $2n^2$
- E. n^2

K9.   If x = -3, what is the value of $2x^2 + 3x - 5$?

- A. -22
- B. -6
- C. -5
- D. 4
- E. 22

K10.   Which of the following is the complete factorization of $2x^2 - 13x - 24$?

- A. $(2x - 6)(x + 4)$
- B. $(x - 6)(2x + 4)$
- C. $(2x - 3)(x - 8)$
- D. $(2x + 3)(x - 8)$
- E. $2(x + 3)(x - 4)$

1C 2D 3B 4B 5E 6D 7E 8D 9D 10D

Answers at the end. Solutions can be found on the web site.
http://www.highlands.edu/site/academic-support-compass-math-practice

L1.   Which of these is the product of (a + 2b) and (c - d) ?
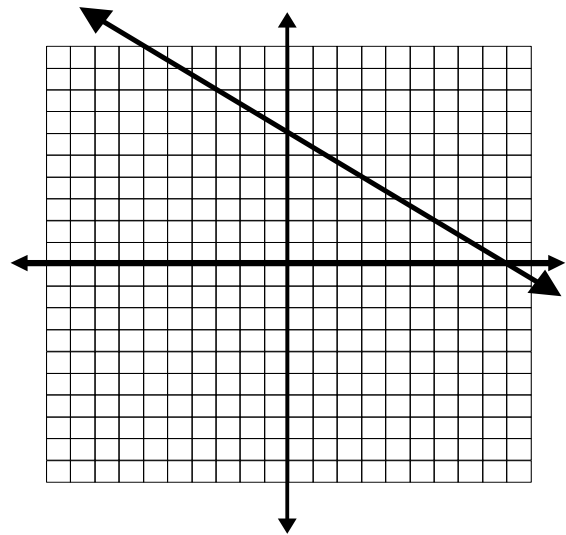
○ A.   ac + ad + bc - 2bd   ○ D.   ac - ad + 2bc + 2bd
○ B.   ac - ad + bc - 2bd   ○ E.   ac - ad + 2bc - 2bd
○ C.   ac - ad + bc - 2bd

L2.   If a = -2 and b = 3, what is the value of the expression 3(a + b)(a - b).

○ A.   -5   ○ D.   -15
○ B.   5   ○ E.   75
○ C.   15

L3.   This is a graph of which equation?

○ A. $y = -\dfrac{3}{2}x + 6$

○ B. $y = \dfrac{3}{2}x + 6$

○ C. $y = \dfrac{2}{3}x + 6$

○ D. $y = -\dfrac{2}{3}x + 6$

○ E. $y = -\dfrac{2}{3}x - 6$

L4.   What is the solution to the equation 2(x + 3) - 3(x + 5) = 13 ?

○ A.   -22   ○ D.   5
○ B.   -12   ○ E.   15
○ C.   -4

L5.   Peggy gets paid a weekly salary of D dollars a week plus a commission of 8% on her
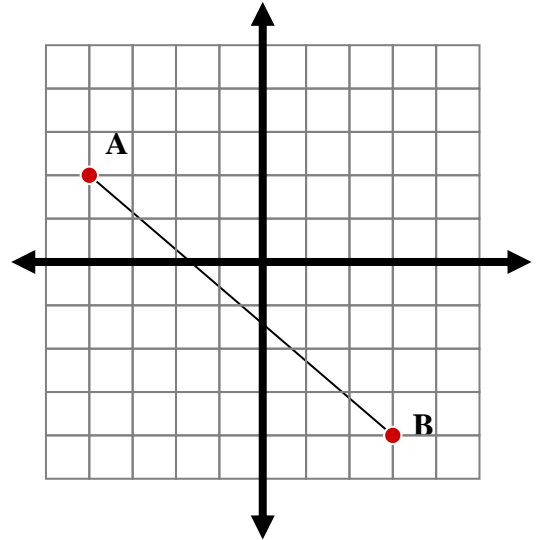   total sales S. Which expression below best describes Peggy's weekly pay?

○ A.   D + S   ○ D.   D + .08S
○ B.   8D + S   ○ E.   .08(D + S)
○ C.   D + 8S

L6.   Which of these is the product of $(D^3 + 2D^2 - 2D + 3)$ and $(D - 5)$?

O A. $D^4 + 2D^3 - 2D^2 + 3D$
O B. $D^4 - 3D^3 - 8D^2 + 13D - 15$
O C. $D^4 - 3D^3 - 12D^2 - 7D - 15$
O D. $D^4 + 7D^3 + 12D^2 + 13D + 15$
O E. $D^4 - 3D^3 - 12D^2 + 13D - 15$

L7.   What is the distance from point A to point B?

O A.   13
O B.   85
O C. $\sqrt{5}$
O D. $\sqrt{13}$
O E. $\sqrt{85}$

L8.   For all $a \neq 0$ and $b \neq 0$, $\dfrac{a^{-3}b^2}{a^5 b^{-4}}$

O A. $\dfrac{a^2}{b^2}$ O D. $\dfrac{b^6}{a^8}$

O B. $\dfrac{b^3}{a^4}$ O E. $\dfrac{1}{a^2 b^2}$

O C. $\dfrac{b^6}{a^2}$

L9.   For all a, b, and c, $(a^3 b^2 c)^2$

O A. $a^5 b^4 c^2$ O D. $a^5 b^4 c^3$
O B. $a^6 b^4 c^2$ O E. $2a^3 b^2 c$
O C. $a^9 b^4 c^2$

L10.   For all x, $3(2x + 5) - 4(x - 2) = 3(2x + 2) + 1$

O A.   x = 9   O D.   x = 3
O B.   x = -5   O E.   x = 0
O C.   x = 4
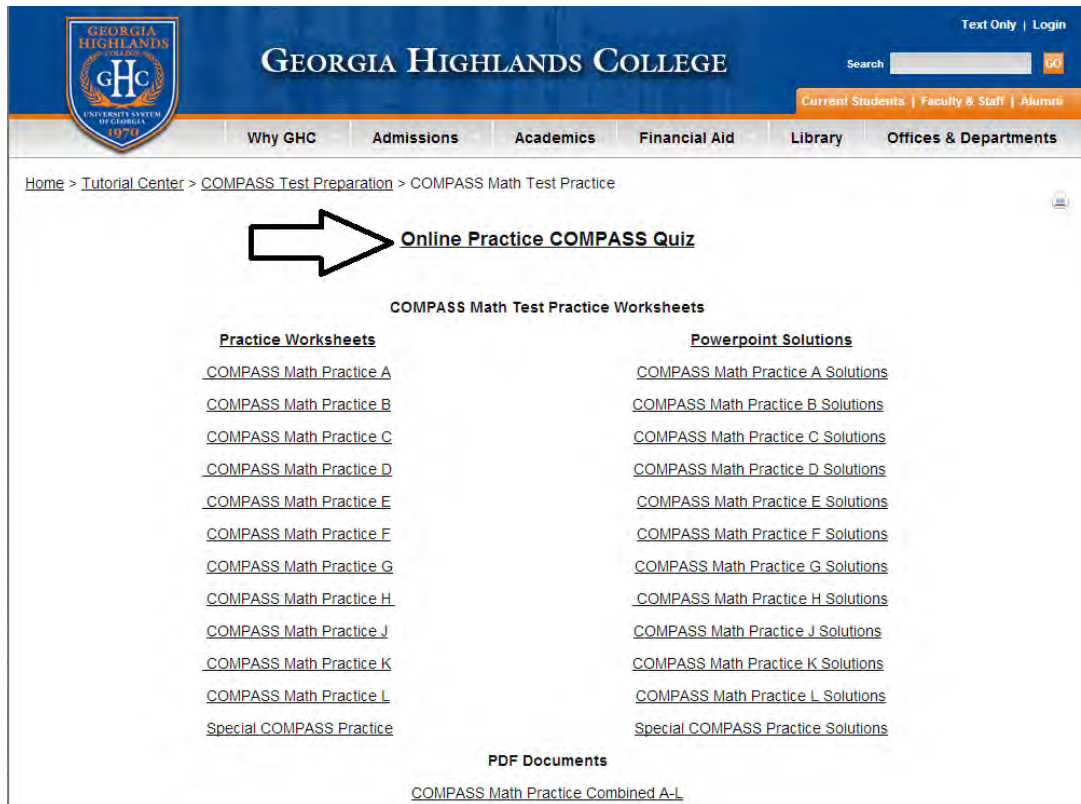
1E 2D 3D 4A 5D 6E 7E 8D 9B 10C

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Section 7

Websites for Additional Practice

Online Practice COMPASS Quiz

http://www.highlands.edu/site/tutorial-center-compass-test-practice
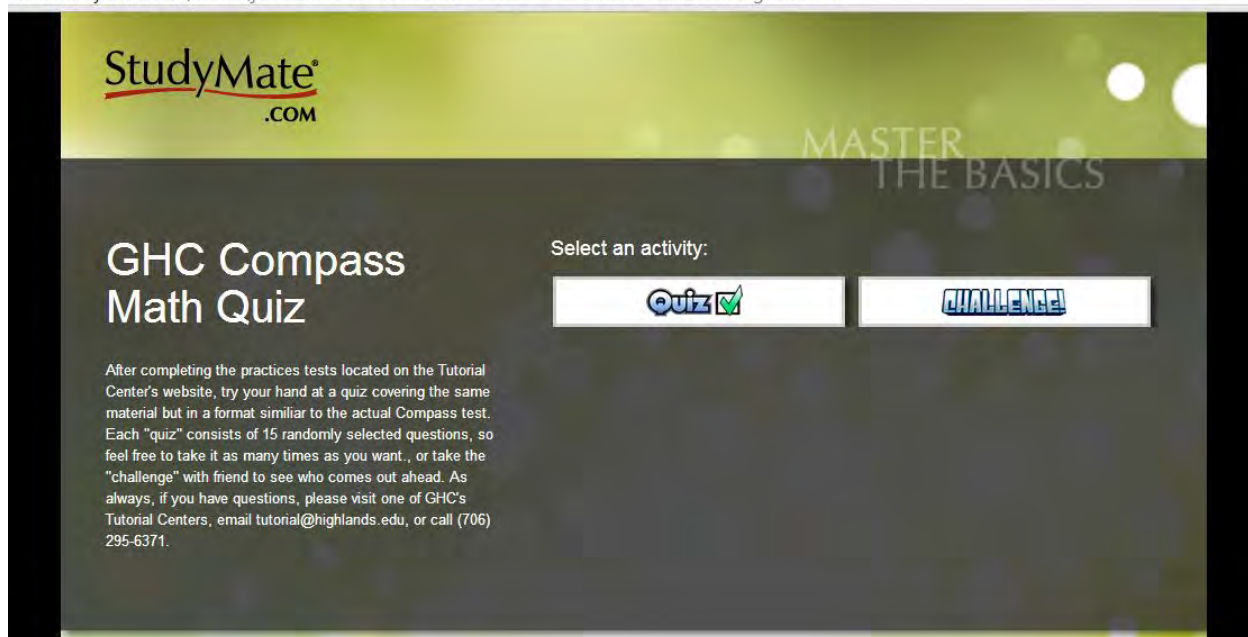

*Interactive Quiz and Two-person Challenge for Study with a Friend

http://www.studymate.com/sm.do;jsessionid=71233806A765167BDD4424DDE4ECADB3?id=3kgHLsBcs

Websites to Review Math Concepts

Website: Kahn Academy   **Arithmetic and PreAlgebra**   **For help on many topics**

https://www.khanacademy.org/math/arithmetic

Website: Brazosport College   **PreAlgebra, Beginning and Intermediate Algebra Videos and Practice**

http://www.brazosport.edu/sites/CurrentStudents/TransitionalEducation/Study%20Skills/AlgebraLearningModules.aspx

Website: Purple Math

http://www.purplemath.com/

Website: CoolMath.com   **Excellent Lessons**

http://coolmath.com/prealgebra/index.html
http://coolmath.com/algebra/index.html

Websites to Practice for COMPASS Math

Website: CUNY Diagnostic and Practice for PreAlgebra and Algebra   <u>EXCELLENT!</u>

The best Diagnostic Tests for PreAlgebra we found! With corrective practice for each question missed.

http://www.hostos.cuny.edu/oaa/compass/
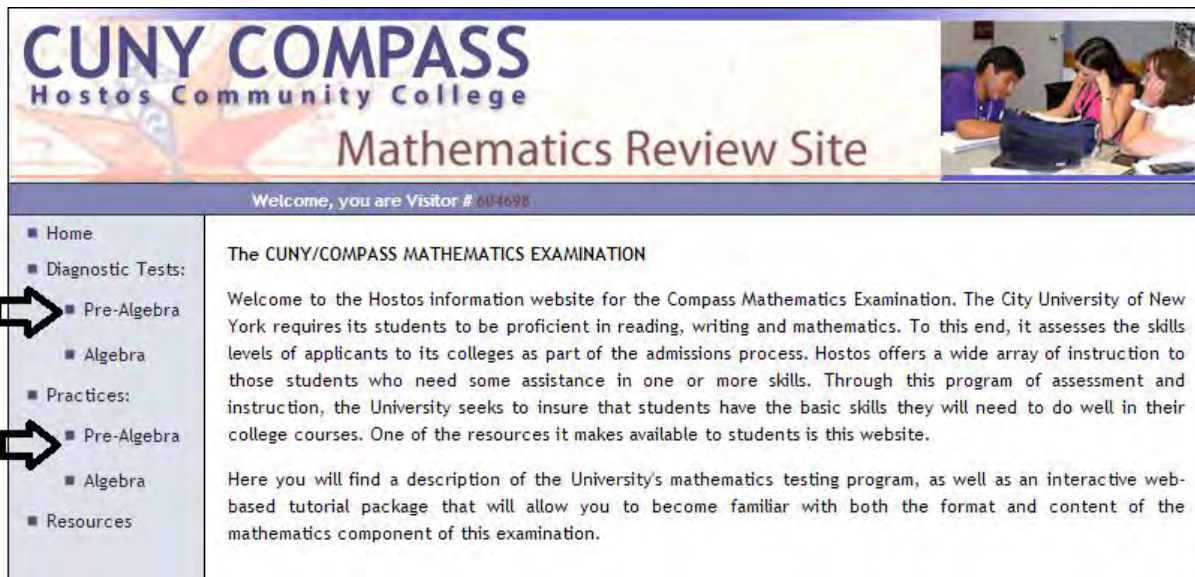
 COMPASS mobile software

http://www.hostos.cuny.edu/oaa/compass/resources.htm

Website: Johnson County Community College   <u>EXCELLENT!</u>

with 34 question PreAlgebra practice **with you tube videos** if you miss a problem!

http://blogs.jccc.edu/math/math-placement/pre-algebra-compass-review-topics/

PreAlgebra Preparation Packet reference to Kahn Academy topics

http://www.jccc.edu/files/pdf/testing-services/COMPASS-Prealgebra-videos.pdf

Website: BrainFuse   <u>EXCELLENT!</u>

http://www.brainfuse.com/highed/accuTests.asp?s=c

Excellent compass preparation tests. Sign up for free BrainFuse. Avoid LiveHelp (costs money)

Websites to Practice for COMPASS Math

Website: mycompasstest.com   <u>**EXCELLENT!**</u>

http://www.mycompasstest.com/

http://www.mycompasstest.com/about/

http://www.mycompasstest.com/exam-strategy/

http://www.mycompasstest.com/study-guide/

http://www.mycompasstest.com/study-guide/pre-algebra/

http://www.mycompasstest.com/study-guide/algebra/

http://www.mycompasstest.com/practice-tests/practice-test-1/

http://www.mycompasstest.com/practice-tests/practice-test-1/solutions/

http://www.mycompasstest.com/practice-tests/practice-test-2/

http://www.mycompasstest.com/practice-tests/practice-test-2/solutions/

Website: Analyze Math Compass Practice with worked out solutions

http://www.analyzemath.com/practice_tests.html

http://www.analyzemath.com/practice_tests/compass/sample_1.html

http://www.analyzemath.com/practice_tests/compass/sample_1_solution.html

Fractions and Percentages (PreAlgebra):

http://www.analyzemath.com/practice_tests/compass/sample_12.html

Website: testprepreview has self-assessment modules for many topics including PreAlgebra

http://www.testprepreview.com/compass_practice.htm

Website: New England Institute of Technology Practice Tests

http://wcb.neit.edu/asc/prctctst.htm

COMPASS®/ESL

**Sample Test Questions—
A Guide for Students and Parents**

Mathematics

Numerical Skills/Pre-Algebra
Algebra

Note to Students

Welcome to the COMPASS Sample Mathematics Test!

You are about to look at some sample test questions as you prepare to take the actual COMPASS test. The examples in this booklet are similar to the kinds of test questions you are likely to see when you take the actual COMPASS test. Since this is a practice exercise, you will answer just a few questions and you won't receive a real test score. The answer key follows the sample questions.

Once you are ready to take the actual COMPASS test, you need to know that the test is computer delivered and *untimed*—that is, you may work at your own pace. After you complete the test, you can get a score report to help you make good choices when you register for college classes.

We hope you benefit from these sample questions, and we wish you success as you pursue your education and career goals!

Note to Parents

The test questions in this sample set are similar to the kinds of test questions your son or daughter will encounter when they take the actual COMPASS test. Since these questions are only for practice, they do not produce a test score; students answer more questions on the actual test. The aim of this booklet is to give a sense of the kinds of questions examinees will face and their level of difficulty. There is an answer key at the end.

COMPASS Mathematics Tests

The COMPASS Mathematics Tests are organized around five principal content domains: numerical skills/prealgebra, algebra, college algebra, geometry, and trigonometry. To ensure variety in the content and complexity of items within each domain, COMPASS includes mathematics items of three general levels of cognitive complexity: basic skills, application, and analysis. A basic skills item can be solved by performing a sequence of basic operations. An application item involves applying sequences of basic operations to novel settings or in complex ways. An analysis item requires students to demonstrate a conceptual understanding of the principles and relationships relevant to particular mathematical operations. Items in each of the content domains sample extensively from these three cognitive levels.

Students are permitted to use calculators on all current Windows® and Internet versions of COMPASS Mathematics Tests. Calculators must, however, meet ACT's specifications, which are the same for COMPASS and the ACT Assessment. These specifications are updated periodically and can be found at ACT's website at
http://www.act.org/aap/taking/calculator.html

Numerical Skills/Prealgebra and Algebra Tests

Numerical Skills/Prealgebra Placement Test

Questions in the Numerical Skills/Prealgebra Placement Test range in content from basic arithmetic concepts and skills to the knowledge and skills considered prerequisites for a first algebra course. The Numerical Skills/Prealgebra Placement Test includes items from more than a dozen content areas; however, a majority of the questions come from the following categories:

1. Operations with Integers
2. Operations with Fractions
3. Operations with Decimals
4. Positive Integer Exponents, Square Roots, and Scientific Notation
5. Ratios and Proportions
6. Percentages
7. Averages (Means, Medians, and Modes)

Sample items for each of these categories are presented later in this section.

Algebra Placement Test

The Algebra Placement Test is composed of items from three curricular areas: elementary algebra, coordinate geometry, and intermediate algebra. Each of these three areas is further subdivided into a number of more specific content areas. Overall, the Algebra Placement Test includes items from more than 20 content areas; however, the majority of test questions fall within the following eight content areas:

1. Substituting Values into Algebraic Expressions
2. Setting Up Equations for Given Situations
3. Basic Operations with Polynomials
4. Factoring Polynomials
5. Linear Equations in One Variable
6. Exponents and Radicals
7. Rational Expressions
8. Linear Equations in Two Variables

Sample items for each of these categories are presented later in this section.

Numerical Skills/Prealgebra

1. $54 - 6 \div 2 + 6 = ?$

    A. 6
    B. 24
    C. 27
    D. 30
    E. 57

2. The lowest temperature on a winter morning was –8°F. Later that same day the temperature reached a high of 24°F. By how many degrees Fahrenheit did the temperature increase?

    A. 3°
    B. 8°
    C. 16°
    D. 24°
    E. 32°

3. If $\left(\frac{3}{4} - \frac{2}{3}\right) + \left(\frac{1}{2} + \frac{1}{3}\right)$ is calculated and the answer reduced to simplest terms, what is the denominator of the resulting fraction?

    A. 24
    B. 12
    C. 6
    D. 4
    E. 3

4. $\frac{1}{2} + \left(\frac{2}{3} \div \frac{3}{4}\right) - \left(\frac{4}{5} \times \frac{5}{6}\right) = ?$

    A. $\frac{1}{16}$
    B. $\frac{17}{27}$
    C. $\frac{13}{18}$
    D. $\frac{7}{9}$
    E. $\frac{5}{6}$

1

5. Mr. Brown went grocery shopping to buy meat for his annual office picnic. He bought $7\frac{3}{4}$ pounds of hamburger, 17.85 pounds of chicken, and $6\frac{1}{2}$ pounds of steak. How many pounds of meat did Mr. Brown buy?

   A.   32.10
   B.   31.31
   C.   26.25
   D.   22.10
   E.   21.10

6. Four students about to purchase concert tickets for $18.50 for each ticket discover that they may purchase a block of 5 tickets for $80.00. How much would each of the 4 save if they can get a fifth person to join them and the 5 people equally divide the price of the 5-ticket block?

   A. $ 1.50
   B. $ 2.50
   C. $ 3.13
   D. $10.00
   E. $12.50

7. In scientific notation, $20,000 + 3,400,000 = ?$

   A. 3.42×10^6
   B. 3.60×10^6
   C. 3.42×10^7
   D. 3.60×10^7
   E. 3.60×10^{12}

8. Saying that $4 < \sqrt{x} < 9$ is equivalent to saying what about x ?

   A. $0 < x < 5$
   B. $0 < x < 65$
   C. $2 < x < 3$
   D. $4 < x < 9$
   E. $16 < x < 81$

     2

9. What value of x solves the following proportion?

$$\frac{9}{6} = \frac{x}{8}$$

A. $5\frac{1}{3}$

B. $6\frac{3}{4}$

C. $10\frac{1}{2}$

D. 11

E. 12

10. If the total cost of x apples is b cents, what is a general formula for the cost, in cents, of y apples?

A. $\frac{b}{xy}$

B. $\frac{x}{by}$

C. $\frac{xy}{b}$

D. $\frac{by}{x}$

E. $\frac{bx}{y}$

11. On a math test, 12 students earned an A. This number is exactly 25% of the total number of students in the class. How many students are in the class?

A. 15
B. 16
C. 21
D. 30
E. 48

12. This year, 75% of the graduating class of Harriet Tubman High School had taken at least 8 math courses. Of the remaining class members, 60% had taken 6 or 7 math courses. What percent of the graduating class had taken fewer than 6 math courses?

A. 0%
B. 10%
C. 15%
D. 30%
E. 45%

3

13. Adam tried to compute the average of his 7 test scores. He mistakenly divided the correct sum of all of his test scores by 6, which yielded 84. What is Adam's correct average test score?

   A. 70
   B. 72
   C. 84
   D. 96
   E. 98

14. A total of 50 juniors and seniors were given a mathematics test. The 35 juniors attained an average score of 80 while the 15 seniors attained an average of 70. What was the average score for all 50 students who took the test?

   A. 73
   B. 75
   C. 76
   D. 77
   E. 78

Correct Answers for Sample Numerical Skills/Prealgebra Items

Item Number	Correct Answer	Content Category
1	E	Operations with Integers
2	E	Operations with Integers
3	B	Operations with Fractions
4	C	Operations with Fractions
5	A	Operations with Decimals
6	B	Operations with Decimals
7	A	Exponents
8	E	Exponents
9	E	Ratios and Proportions
10	D	Ratios and Proportions
11	E	Percentages
12	B	Percentages
13	B	Averages
14	D	Averages

Algebra

1. If $x = -3$, what is the value of $\frac{x^2 - 1}{x + 1}$?

    A. -4

    B. -2

    C. 2

    D. $3\frac{2}{3}$

    E. 5

2. Doctors use the term *maximum heart rate* (*MHR*) when referring to the quantity found by starting with 220 beats per minute and subtracting 1 beat per minute for each year of a person's age. Doctors recommend exercising 3 or 4 times each week for at least 20 minutes with your heart rate increased from its *resting heart rate* (*RHR*) to its *training heart rate* (*THR*), where

    $$THR = RHR + .65(MHR - RHR)$$

    Which of the following is closest to the *THR* of a 43-year-old person whose *RHR* is 54 beats per minute?

    A.   197
    B.   169
    C.   162
    D.   134
    E.   80

3. When getting into shape by exercising, the subject's maximum recommended number of heartbeats per minute (h) can be determined by subtracting the subject's age (a) from 220 and then taking 75% of that value. This relation is expressed by which of the following formulas?

    A. $h = .75(220 - a)$
    B. $h = .75(220) - a$
    C. $h = 220 - .75a$
    D. $.75h = 220 - a$
    E. $220 = .75(h - a)$

4. An airplane flew for 8 hours at an airspeed of x miles per hour (mph), and for 7 more hours at 325 mph. If the average airspeed for the entire flight was 350 mph, which of the following equations could be used to find x ?

   A. $x \;+\;\;\;\; 325 = 2(350)$
   B. $x \;+\; 7(325) = 15(350)$
   C. $8x \;-\; 7(325) = 350$
   D. $8x \;+\; 7(325) = 2(350)$
   E. $8x \;+\; 7(325) = 15(350)$

5. Which of the following is equivalent to
   $3a + 4b - (-6a - 3b)$?

   A. $16ab$
   B. $-3a \;+\; b$
   C. $-3a \;+\; 7b$
   D. $9a \;+\; b$
   E. $9a \;+\; 7b$

6. What is the sum of the polynomials $3a^2b + 2a^2b^2$ and
   $-ab^2 + a^2b^2$?

   A. $3a^2b \;-\; ab^2 + 3a^2b^2$
   B. $3a^2b \;-\; ab^2 + 2a^2b^2$
   C. $2a^2b \;+\; 3a^2b^2$
   D. $2a^2b^3 \;+\; 2a^4b^4$
   E. $-3a^3b^3 \;+\; 2a^4b$

7. Which of the following is a factor of the polynomial
   $x^2 - x - 20$?

   A. $x - 5$
   B. $x - 4$
   C. $x + 2$
   D. $x + 5$
   E. $x + 10$

8. Which of the following is a factor of $x^2 - 5x - 6$?

   A. $(x + 2)$
   B. $(x - 6)$
   C. $(x - 3)$
   D. $(x - 2)$
   E. $(x - 1)$

9.   If $2(x - 5) = -11$, then $x = $?

     A. $-\frac{21}{2}$

     B. -8

     C. $-\frac{11}{2}$

     D. -3

     E. $-\frac{1}{2}$

10.   If $\frac{4}{5} + \left(-\frac{3}{10}\right) = x + 1\frac{1}{2}$, then $x = $?

     A. 2
     B. 1
     C. -1
     D. -2
     E. -10

11.   For all nonzero r, t, and z values, $\frac{16r^3tz^5}{-4rt^3z^2} = $?

     A. $-\frac{4z^3}{r^2t^2}$

     B. $-\frac{4r^2z^3}{t^2}$

     C. $-\frac{4rz}{t}$

     D. $-4r^4t^4z^7$

     E. $-4r^2t^2z^3$

12.   For all $x > 0$ and $y > 0$, the radical expression $\frac{\sqrt{x}}{3\sqrt{x} - \sqrt{y}}$ is equivalent to:

     A. $\frac{3x - \sqrt{xy}}{9x + y}$

     B. $\frac{3x - \sqrt{xy}}{3x + y}$

     C. $\frac{3x + \sqrt{xy}}{9x - y}$

     D. $\frac{3x + \sqrt{xy}}{3x - y}$

     E. $\frac{x}{3x - y}$

        8

13. For all $x \neq -4$, which of the following is equivalent to the expression below?

$$\frac{x^2 + 12x + 32}{x + 4}$$

   A. $x + 3$
   B. $x + 8$
   C. $x + 11$
   D. $x + 16$
   E. $x + 28$

14. Which of the following is a simplified expression equal to $\frac{9 - x^2}{x - 3}$ for all $x < -3$?

   A. $3x$
   B. $x + 3$
   C. $x - 3$
   D. $-x + 3$
   E. $-x - 3$

15. What is the slope of the line with the equation $2x + 3y + 6 = 0$?

   A. -6
   B. -3
   C. -2
   D. $-\frac{2}{3}$
   E. $\frac{2}{3}$

16. Point A $(-4,1)$ is in the standard (x,y) coordinate plane. What must be the coordinates of point B so that the line $x = 2$ is the perpendicular bisector of $\overline{AB}$?

   A. $(-6, \ 1)$
   B. $(-4,-1)$
   C. $(-4, \ 3)$
   D. $(-2, \ 1)$
   E. $(\ 8, \ 1)$

Correct Answers for Sample Algebra Items

Item Number	Correct Answer	Content Category
1	A	Substituting Values into Algebraic Expressions
2	D	Substituting Values into Algebraic Expressions
3	A	Setting Up Equations for Given Situations
4	E	Setting Up Equations for Given Situations
5	E	Basic Operations with Polynomials
6	A	Basic Operations with Polynomials
7	A	Factoring Polynomials
8	B	Factoring Polynomials
9	E	Linear Equations in One Variable
10	C	Linear Equations in One Variable
11	B	Exponents
12	C	Exponents
13	B	Rational Expressions
14	E	Rational Expressions
15	D	Linear Equations in Two Variables
16	E	Linear Equations in Two Variables