Final Exam Review
Grade 9 Math

Good stuff to know:

- You must use the π button on your calculator (and not 3.14) during the PAT.
- The test is 75 minutes (plus an extra 30 minutes if you need it)
- You cannot use a graphing calculator or any other non-conventional calculator (e.g. iPod)
- You CAN use manipulatives (e.g. algebra tiles, building blocks)
- There are 40 multiple choice and 10 numeric response questions on the test
- There is a formula sheet (I'll show it to you)

Here is how the test is broken down:

Content Domain of Test	
Strand	**Percentage of Items on Test**
Number	25 – 35%
Patterns and Relations	30 – 40%
Shape and Space	15 – 25%
Statistics and Probability	10 – 20%

I'll provide you with a better copy of this.

Here is the link to the document this came from:

http://education.alberta.ca/admin/testing/achievement/bulletins.aspx

Appendix 2

Grade 9 Mathematics Formula Sheet

The following information may be useful in writing this test.

Area (A)

Circle	$A = \pi r^2$
Rectangle	$A = lw$
Triangle	$A = \frac{bh}{2}$

Volume (V)

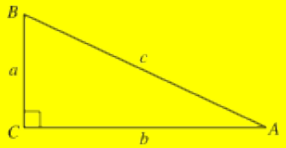
Right Cylinder	$V = \pi r^2 h$
Prism	$V =$ (Base Area)(h)

Circumference (C)

Circle	$C = \pi d$ or $2\pi r$

Pythagorean Theorem

$c^2 = a^2 + b^2$ where c is the hypotenuse



Review Options

- The Key and SNAP
- Textbook
- Selected PAT questions from old exams
- exambank.com
- Review package from other St. Albert schools (online)

How should you study for math?

This is very personal!

I will try to highlight some key areas for you, but you have to guide your own studying.

I have a few handy tips for you on the next pages.

My humble suggestions:

- Organize your review by unit
- Plan to focus more on earlier units
- Break your review into small chunks
- Consider the exam formula sheet
- Make sure you try some old PAT questions
- Work hard at it! Preparing for exams is a very valuable skill

The Key and SNAP

These books are still available at Chapters.

I won't focus my review on these books, but they are a very good place for you to review.

The textbook

Each unit has a Study Guide

This is a great place to start your review of each unit

Study Guide

Polynomials

- A polynomial is one term or the sum of terms whose variables have whole-number exponents; for example, $2m^2 + 3m - 5$
- The numerical value of a term is its coefficient.
- A term that consists of only a number is a constant term.
- The degree of a polynomial in the variable m is the highest power of m in the polynomial.
- A polynomial with: 1 term is a monomial; 2 terms is a binomial; and 3 terms is a trinomial.

Algebra Tiles

We can represent a polynomial with algebra tiles. $2p^2 + 2p - 3$

Like Terms

Like terms are represented by the same type of algebra tile. In symbolic form, like terms have the same variables raised to the same exponent. Like terms can be added or subtracted. $3x^2$ and $2x^2$ are like terms, but $-x$ and 3 are not.

$3x^2$: $2x^2$: $3x^2 + 2x^2$ simplifies to $5x^2$.

$-x$:  3: $-x + 3$ cannot be simplified.

Operations with Polynomials

We can use algebra tiles to model operations with polynomials, then record the answers symbolically.

- To add polynomials, combine like terms:
  $(3r^2 + 5r) + (2r^2 - r) = 3r^2 + 5r + 2r^2 - r$
  $= 5r^2 + 4r$
- To subtract polynomials, use a strategy for subtracting integers:
  $(3r^2 + 5r) - (2r^2 - r) = 3r^2 + 5r - (2r^2) - (-r)$
  $= 3r^2 - 2r^2 + 5r + r$
  $= r^2 + 6r$
- To multiply a polynomial by a monomial, multiply each term of the polynomial by the monomial: $2t(5t - 3) = 2t(5t) + 2t(-3)$
  $= 10t^2 - 6t$
- To divide a polynomial by a monomial, divide each term of the polynomial by the monomial:
  $\frac{21x^2 - 14x}{7x} = \frac{21x^2}{7x} - \frac{14x}{7x}$
  $= 3x - 2$

The textbook

Each unit has a Mid-Unit Review

These refer to textbook sections

Mid-Unit Review

5.1

1. In each polynomial, identify:
the variable, number of terms, coefficients, constant term, and degree.

a) $3m - 5$
b) $4r$
c) $x^2 + 4x + 1$

2. Create a polynomial that meets these conditions:
trinomial in variable m, degree 2, constant term is -5

3. Which polynomial is represented by each set of algebra tiles? Is the polynomial a monomial, binomial, or trinomial? How do you know?

a) 

b) 

c) 

4. Use algebra tiles to represent each polynomial. Sketch the tiles you used.
a) $4n - 2$
b) $-t^2 + 4t$
c) $2d^2 + 3d + 2$

5.2

5. For each pair of monomials, which are like terms? Explain how you know.
a) $2x, -5x$ b) $3, 4g$
c) $10, 2$ d) $2q^2, -7q^2$
e) $8x^2, 3x$ f) $-5x, -5x^2$

6. Simplify $3x^2 - 7 + 3 - 5x^2 - 3x + 5$. Explain how you did this.

7. Renata simplified a polynomial and got $4x^2 + 2x - 7$. Her friend simplified the same polynomial and got $-7 + 4x^2 + 2x$. Renata thinks her friend's answer is wrong. Do you agree? Explain.

8. Cooper thinks that $5x - 2$ simplifies to $3x$. Is he correct? Explain.
Use algebra tiles to support your explanation.

9. Identify the equivalent polynomials.
Justify your answers.
a) $1 + 3x - x^2$
b) $1 + 3x^2 - x^2 + 2x - 2x^2 + x - 2$
c) $x^2 - 3x - 1$
d) $6 + 6x - 6x^2 - 4x - 5 + 2x^2 + x^2 - 4$
e) $3x - 1$
f) $-3x^2 + 2x - 3$
g) $6x^2 - 6x - 6 + x - 5x^2 - 1 + 2x + 4$
h) $3x - x^2 + 1$

5.3
5.4

10. Use algebra tiles to add or subtract.
Sketch the tiles you used.
a) $(4f^2 - 4f) + (-2f^2)$
b) $(3r^2 + 2r + 5) + (-7r^2 + r - 3)$
c) $(-2v + 5) - (-9v + 3)$
d) $(-2g^2 - 12) - (-6g^2 + 4g - 1)$

11. Add or subtract. Use a strategy of your choice.
a) $(3w^2 + 17w) + (12w^2 - 3w)$
b) $(5m^2 - 3) + (m^2 + 3)$
c) $(-3h - 12) - (-9h - 6)$
d) $(6a^2 + 2a - 2) + (-7a^2 + 4a + 11)$
e) $(3y^2 + 9y + 7) - (2y^2 - 4y + 13)$
f) $(-14 + 3p^2 + 2p) - (-5p + 10 - 7p^2)$

12. a) Which polynomial must be added to $5x^2 + 3x - 2$ to get $7x^2 + 5x + 1$?
b) Which polynomial must be subtracted from $5x^2 + 3x - 2$ to get $7x^2 + 5x + 1$?
Justify your answers.

The textbook

Each unit has a Final Review

Review

5.1

1. Use algebra tiles to model each polynomial. Sketch the tiles you used.

a) $2u^2 + 5u$ b) $4n^2 - 2n - 3$

2. Identify the variables, coefficients, and constant terms in each polynomial.

a) $4w - 3$ b) $5v^2 + 3$ c) $5y - 6 - y^2$

3. Classify each polynomial below:

i) according to the number of terms

ii) according to its degree

a) $3f + 5$ b) $-2g^2$ c) $5h - 6 - h^2$

4. Use algebra tiles to model the polynomial that fits each description. Sketch the tiles you used.

a) a second-degree trinomial in the variable y, the coefficients of the variable when the polynomial is written in descending order are -1 and -3, and with constant term 4

b) a first-degree binomial in the variable x, with constant term 4, and the coefficient of the other term is -3

5. Identify the equivalent polynomials. Explain how you know they are equivalent.

a) $-3x^2 + 3x - 11$ b) $3x^2 + 4x$

c) $-2 - x$ d) $7 + 5x$

e) $5x + 7$ f) $x - 2$

g) $4x + 3x^2$ h) $3x - 11 - 3x^2$

6. Which polynomial is modelled by each set of algebra tiles?

State the degree of the polynomial.

a)

b)

c)

7. Jennie does not understand how the terms $2k$ and k^2 are different. Use algebra tiles to model these terms and explain the difference.

8. For each polynomial, write an equivalent polynomial.

a) $-1 - 2h$ b) $3j + 2j^2 - 4$ c) $-5p + p^2$

5.2

9. Identify like terms.

a) $5x^2, 3y^2, -2x^2, 5x, 2y$

b) $-8x, 5x, 8, -2, -x, 11$

10. Match each algebra tile model below with its corresponding polynomial.

a) $n^2 - n + 3$ b) $-w^2 - 3$

c) $-2t$ d) $2q + 2$

e) $2r^2 - 2r + 1$

A

B

C

D

E

11. Write an expression with 5 terms that has only 3 terms when simplified.

The textbook

Each unit has a Practice Test

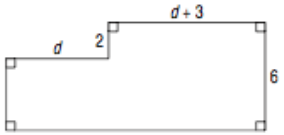
These do not cover all concepts

Practice Test

1. a) Which polynomial in t do these tiles represent?

b) Classify the polynomial by degree and by the number of terms.
c) Identify the constant term and the coefficient of the t^2-term.

2. a) Write a polynomial for the perimeter of this shape. Simplify the polynomial.



b) Determine the perimeter of the shape when $d = 5$ m.

3. Sketch algebra tiles to explain why:
a) $3x + 2x$ equals $5x$ b) $(3x)(2x)$ equals $6x^2$

4. A student determined the product $3r(r + 4)$.
The student's answer was $3r^2 + 4$.
Use a model to explain whether the student's answer is correct.

5. Add or subtract as indicated. What strategy will you use each time?
a) $(15 - 3d) + (3 - 15d)$ b) $(9h + 3) - (9 - 3h^2)$
c) $(2y^2 + 5y - 6) + (-7y^2 + 2y - 6)$ d) $(7y^2 + y) - (3y - y^2)$

6. Multiply or divide as indicated. What strategy will you use each time?
a) $25m(3m - 2)$ b) $-5(3v^2 - 2v - 1)$
c) $(8x^2 - 4x) \div 2x$ d) $\frac{-6 + 3g^2 - 15g}{-3}$

7. Determine two polynomials with:
a) a sum of $3x^2 - 4x - 2$
b) a difference of $3x^2 - 4x - 2$

8. A rectangle has dimensions $5s$ and $3s + 8$.
a) Sketch the rectangle and label it with its dimensions.
b) What is the area of the rectangle?
c) What is the perimeter of the rectangle?

The textbook

There are also 3 cumulative review question sets in the textbook:

Units 1-3 Page 148

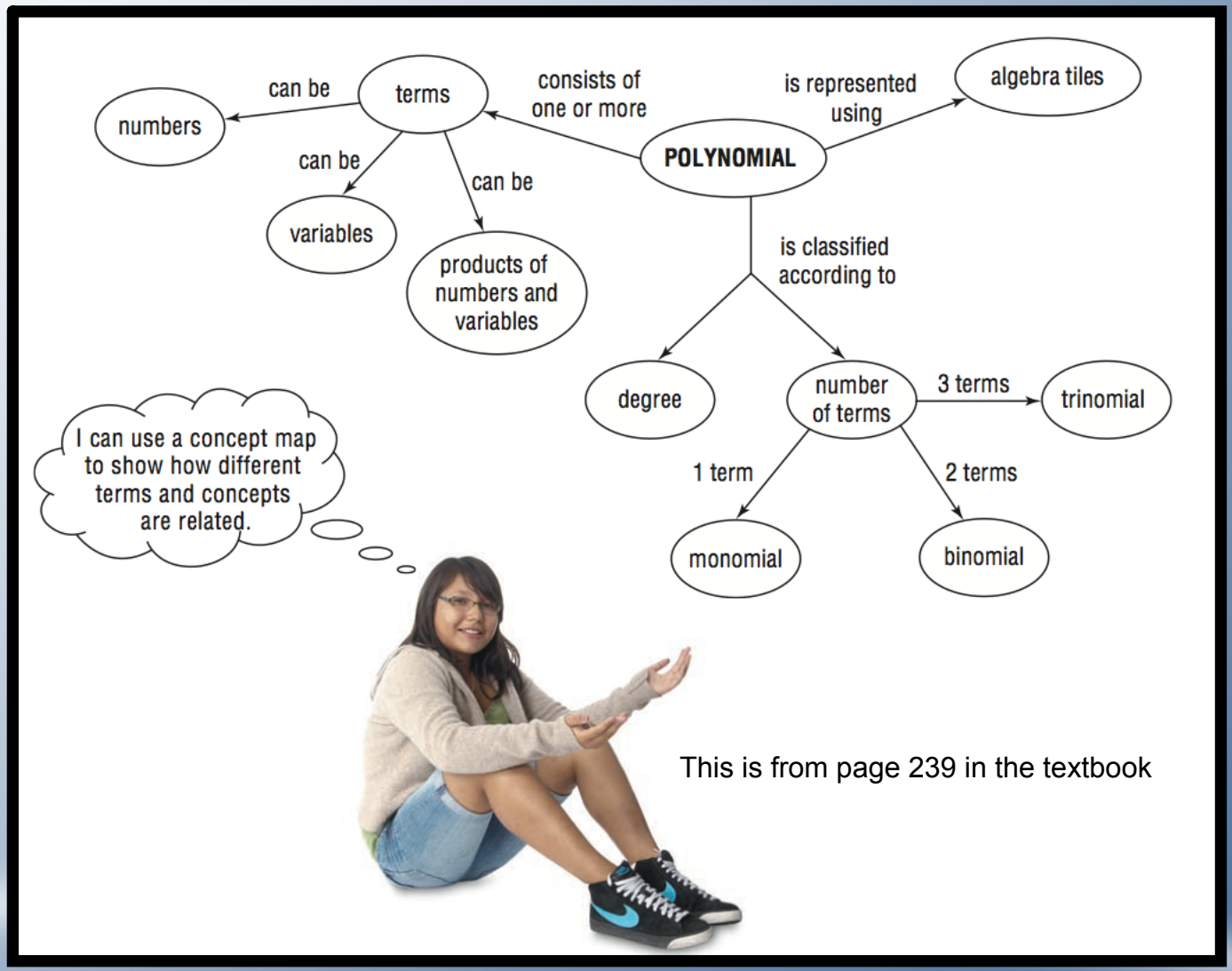
Units 1-6 Page 312

Units 1-9 Page 464

How to organize what you have to know:

- Don't just sit and read
- You learn math by *doing math*
- Ask questions!
- Use questions you don't understand as a starting point for learning
- I have two organizer ideas on the next two slides

A Concept Map



This is from page 239 in the textbook

A Frayer Model

This is from page 238 in the textbook

Like terms

Definition
Like terms have the same variable raised to the same exponent.

Facts/Characteristics
Like terms are represented by algebra tiles with the same size and shape. I can combine like terms by adding their coefficients.

Examples
$-3x$ and $4x$
$5b^2$ and $2b^2$

Non-examples
$-3c$ and 4
$5n^2$ and $2n$

Using questions from previous PATs

- This is an essential part of any study routine
- I will provide you with a package
- questaplus.com

Because of the curriculum change, this isn't a great unguided resource.

I will give you the important questions from this site on paper.

exambank.com

username: SGS
password: simpson

This costs the school about 15 cents every time you select an exam to write.

Review package from other St. Albert schools

- I did not participate in the creation of this
- I will put these online and you can access them with a link I will email and post on Facebook

How to write a good test

We'll cover this in the final few days before the test

Suggestions from the people who wrote the PAT in Math

- Before you begin, find out how much time you have.
- Ask questions if you are unsure of anything.
- Skim through the whole test before beginning. Find out how many questions there are and plan your time accordingly.
- Answer the easier questions first; then go back to the more difficult ones.
- Do not spend too much time on any one question. Make a mark (* or ?) beside any questions you have difficulty with and go back to them if you have time.
- Read each question carefully, underline or highlight key words, and try to determine an answer before looking at the choices.

Suggestions from the people who wrote the PAT in Math

- Read all the choices and see which one best fits the answer.
- When you are not sure which answer is correct, cross out any choices that are wrong, and then select the best of the remaining choices.
- If time permits, recheck your answers.
- Double-check to make sure that you have answered everything before handing in the test.
- Read the information given using the strategy that works best for you. You should either
  - look at all the information and think carefully about it before you try to answer the questions

  OR

  - read the questions first and then look at the information, keeping in mind the question(s) you need to answer.

Suggestions from the people who wrote the PAT in Math

- Make sure that you look at all forms of the information given. Information may be given in words, charts, pictures, graphs, or maps.
- When information is given for more than one question, go back to the information before answering each question.
- Check your work when you calculate an answer, even when your answer is one of the choices.
- When answering "best answer" questions, be sure to carefully read all four alternatives (A, B, C, and D) before choosing the answer that you think is best. These questions will always include a bold-faced qualifier such as **best**, **most strongly**, or **most clearly** in their stems. All the alternatives (A, B, C, and D) are, to some degree, correct, but one of the alternatives will be "best" in that it takes more of the information into account or can be supported most strongly by reference to the information.