

2-1 Writing Equations

Translate each sentence into an equation.

1. Three times r less than 15 equals 6.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *Three times r less than 15 equals 6* is the same as *15 minus 3 times r equals 6*.

$$\begin{array}{cccccccc} 15 & \text{minus} & 3 & \text{times} & r & \text{equals} & 6 \\ 15 & - & 3 & \cdot & r & = & 6 \end{array}$$

The equation is $15 - 3r = 6$.

2. The sum of q and four times t is equal to 29.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *The sum of q and four times t is equal to 29* is the same as *q plus four times t equals 29*.

$$\begin{array}{cccccccc} q & \text{plus} & 4 & \text{times} & t & \text{equals} & 29 \\ q & + & 4 & \cdot & t & = & 29 \end{array}$$

The equation is $q + 4t = 29$.

3. A number n squared plus 12 is the same as the quotient of p and 4.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *A number n squared plus 12 is the same as the quotient of p and 4* is the same as *n squared plus 12 equals p divided by 4*.

$$\begin{array}{cccccccc} n & \text{plus} & 12 & \text{equals} & p & \text{divided} & 4 \\ \text{squared} & & & & & \text{by} & \\ n^2 & + & 12 & = & p & \div & 4 \end{array}$$

The equation is $n^2 + 12 = p \div 4$.

4. Half of j minus 5 is the sum of k and 13.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *Half of j minus 5 is the sum of k and 13* is the same as *one-half times j minus 5 equals k plus 13*.

$$\begin{array}{cccccccc} \text{one-} & \text{times} & j & \text{minus} & 5 & \text{equals} & k & \text{plus} & 13 \\ \text{half} & & & & & & & & \\ \frac{1}{2} & \cdot & j & - & 5 & = & k & + & 13 \end{array}$$

The equation is $\frac{1}{2}j - 5 = k + 13$.

2-1 Writing Equations

5. The sum of 8 and three times k equals the difference of 5 times k and 3.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *The sum of 8 and three times k equals the difference of 5 times k and 3* is the same as *8 plus three times k equals 5 times k minus 3*.

$$\begin{array}{l} 8 \text{ plus } 3 \text{ times } k \text{ equals } 5 \text{ times } k \text{ minus } 3 \\ 8 + 3 \cdot k = 5 \cdot k - 3 \end{array}$$

The equation is $8 + 3k = 5k - 3$.

6. Three fourths of w plus 5 is one half of w increased by nine.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *Three fourths of w plus 5 is one half of w in addition to nine* is the same as *three fourths times w plus 5 equals one half times w plus 9*.

$$\begin{array}{l} \text{three fourths} \quad \text{times } w \text{ plus } 5 \\ \frac{3}{4} \quad \cdot \quad w + 5 \end{array}$$

equals one half times w plus 9

$$= \frac{1}{2} \cdot w + 9$$

$$\text{The equation is } \frac{3}{4}w + 5 = \frac{1}{2}w + 9.$$

7. The quotient of 25 and t plus 6 is the same as twice t plus 1.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *The quotient of 25 and t plus 6 is the same as twice t plus 1* is the same as *25 divided by t plus 6 equals 2 times t plus 1*.

25 divided by t plus 6

$$25 \div t + 6$$

equals 2 times t plus 1

$$= 2 \cdot t + 1$$

$$\text{The equation is } \frac{25}{t} + 6 = 2t + 1.$$

2-1 Writing Equations

8. Thirty-two divided by y is equal to the product of three and y minus four.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *Thirty-two divided by y is equal to the product of three and y minus four* is the same as *thirty-two divided by y equals three times y minus 4*.

$$\begin{array}{cccccccccccc} 32 & \text{divided} & y & \text{equals} & 3 & \text{times} & y & \text{minus} & 4 \\ & \text{by} & & & & & & & \\ 32 & \div & y & = & 3 & \cdot & y & - & 4 \end{array}$$

The equation is $\frac{32}{y} = 3y - 4$.

9. **FINANCIAL LITERACY** Samuel has \$1900 in the bank. He wishes to increase his account to a total of \$2500 by depositing \$30 per week from his paycheck. Write and solve an equation to find how many weeks he needs to reach his goal.

SOLUTION:

Let w = the number of weeks Samuel needs to reach his goal.

$$\begin{array}{ccccccccccc} \$1900 & \text{plus} & \$30 & \text{times} & \text{the} & \text{equals} & \$2500 \\ & & & & \text{number} & & \\ & & & & \text{of} & & \\ & & & & \text{weeks} & & \\ 1900 & + & 30 & \cdot & w & = & 2500 \end{array}$$

$$1900 + 30w = 2500$$

$$1900 - 1900 + 30w = 2500 - 1900$$

$$30w = 600$$

$$w = 20$$

So, it would take Samuel 20 weeks to reach his goal.

10. **CCSS MODELING** Miguel is earning extra money by painting houses. He charges a \$200 fee plus \$12 per can of paint needed to complete the job. Write and use an equation to find how many cans of paint he needs for a \$260 job.

SOLUTION:

Let c = the number of cans of paint needed.

$$\begin{array}{ccccccccccc} \$12 & \text{times} & \text{the} & \text{plus} & \$200 & \text{equals} & \$260 \\ & & \text{number} & & & & \\ & & \text{of cans} & & & & \\ & & \text{of paint} & & & & \\ 12 & \cdot & c & + & 200 & = & 260 \end{array}$$

$$12c + 200 = 260$$

$$12c + 200 - 200 = 260 - 200$$

$$12c = 60$$

$$c = 5$$

So, Miguel needs 5 cans of paint for a \$260 job.

2-1 Writing Equations

Translate each sentence into a formula.

11. The perimeter of a regular pentagon is 5 times the length of each side.

SOLUTION:

Let P = perimeter and s = length of each side. The word *times* suggest multiplication. So, $P = 5s$.

12. The area of a circle is the product of π and the radius r squared.

SOLUTION:

Let A = area and r = radius. The word *product* suggests multiplication, and the word *squared* means to raise a number to the second power. So, $A = \pi r^2$.

13. Four times π times the radius squared is the surface area of a sphere.

SOLUTION:

Let S = surface area. The word *times* suggests multiplication, and the word *squared* means to raise a number to the second power. So, $4\pi r^2 = S$.

14. One third the product of the length of the side squared and the height is the volume of a pyramid with a square base.

SOLUTION:

Let s = the length of one side, h = height, and V = volume. The words *product of* suggest multiplication. The word *squared* means to raise a number to the second power. So, $\frac{1}{3} s^2 h = V$.

Translate each equation into a sentence.

15. $7m - q = 23$

SOLUTION:

$7m$	-	q	=	23
The product of seven and m	minus	q	is equal to	23.

16. $6 + 9k + 5j = 54$

SOLUTION:

6	+	$9k$	+	$5j$	=	54
Six	plus	the product of nine and k	plus	the product of 5 and j	is	54.

17. $3(g + 8) = 4h - 10$

SOLUTION:

3	($g + 8$)	=	$4h$	-	10
Three times	the sum of g and eight	is the same as	4 times h	minus	10.

2-1 Writing Equations

18. $6d^2 - 7f = 8d + f^2$

SOLUTION:

$$6d^2 \quad - \quad 7f$$

Six minus the
times product
 d of
squared seven
and f

$$= \quad 8d \quad + \quad f^2$$

is identical to 8 times d plus f
squared

Write a problem based on the given information.

19. g = gymnasts on a team; $3g = 45$

SOLUTION:

g = gymnasts on a team; $3g = 45$

A team of gymnasts competed in a regional meet. Let the value g represents the number of gymnasts. Then value $3g$ represents three times each gymnast. The total is 45. Thus each member of the team won 3 medals. There were a total of 45 medals won by the team. How many team members were there?

20. c = cost of a notebook; $0.25c$ = markup; $c + 0.25c = 3.75$

SOLUTION:

The value c represents the cost of a notebook. The value $0.25c$ represents the markup, or an added cost to the item. The sum of these values represents a total cost of the item and markup.

A store receives a shipment of notebooks that costs the store c dollars per notebook. To sell the notebooks, the store marks them up by 25%. If the store charges \$3.75 for each notebook, what was the original cost of the notebook?

Translate each sentence into an equation.

21. The difference of f and five times g is the same as 25 minus f .

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *The difference of f and five times g is the same as 25 minus f is the same as f minus 5 times g equals 25 minus f .*

$$\begin{array}{cccccccccccc} f & \text{minus} & 5 & \text{times} & g & \text{equals} & 25 & \text{minus} & f \\ f & - & 5 & \cdot & g & = & 25 & - & f \end{array}$$

The equation is $f - 5g = 25 - f$.

2-1 Writing Equations

22. Three times b less than 100 is equal to the product of 6 and b .

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *Three times b less than 100 is equal to the product of 6 and b is the same as 100 minus 3 times b equals 6 times b .*

$$\begin{array}{cccccccccccc} 100 & \text{minus} & 3 & \text{times} & b & \text{equals} & 6 & \text{times} & b \\ 100 & - & 3 & \cdot & b & = & 6 & \cdot & b \end{array}$$

The equation is $100 - 3b = 6b$.

23. Four times the sum of 14 and c is a squared.

SOLUTION:

Rewrite the verbal sentence so it is easier to translate. *Four times the sum of 14 and c is a squared is the same as four times 14 plus c equals a squared.*

$$\begin{array}{ccccccc} \text{four} & \text{times} & \text{14 plus } c & \text{equals} & a \text{ squared} \\ 4 & \cdot & (14 + c) & = & a^2 \end{array}$$

The equation is $4(14 + c) = a^2$.

24. **MUSIC** The eight–note interval of white keys between two notes with the same name is called an octave. A piano has 52 white keys. Write and use an equation to find the number of octaves on a piano keyboard.

SOLUTION:

Let k = the number of octaves on a piano keyboard.

$$\begin{array}{ccccccc} 8 & \text{times} & \text{the number} & \text{equals} & 52 \\ & & \text{of octaves} & & \\ & & \text{on a piano} & & \\ & & \text{keyboard} & & \\ 8 & \cdot & k & = & 52 \end{array}$$

$$8k = 52$$

$$k = 6\frac{1}{2}$$

There are $6\frac{1}{2}$ octaves on a piano keyboard.

2-1 Writing Equations

25. **GARDENING** A flat of plants contains 12 plants. Yoshi wants a garden that has three rows with 10 plants per row. Write and solve an equation for the number of flats Yoshi should buy.

SOLUTION:

Let f = the number of flats Yoshi should buy.

3 times 10 equals 12 times the number of flats
 $3 \cdot 10 = 12 \cdot f$

$$3 \cdot 10 = 12f$$

$$30 = 12f$$

$$2\frac{1}{2} = f$$

Yoshi should buy $2\frac{1}{2}$ flats.

Translate each sentence into a formula.

26. The perimeter of a rectangle is equal to 2 times the length plus twice the width.

SOLUTION:

Let P = perimeter, ℓ = length, and w = width. The words *times* and *twice* suggest multiplication and the word *plus* suggests addition. So, $P = 2\ell + 2w$.

27. Celsius temperature C is five ninths times the difference of the Fahrenheit temperature F and 32.

SOLUTION:

The word *times* suggests multiplication and the word *difference* suggests subtraction. So, $C = \frac{5}{9}(F - 32)$.

28. The density of an object is the quotient of its mass and its volume.

SOLUTION:

Let D = density, m = mass, and v = volume. The word *quotient* suggests division. So, $D = \frac{m}{v}$.

29. Simple interest is computed by finding the product of the principal amount p , the interest rate r , and the time t .

SOLUTION:

Let I = simple interest. The word *product* suggests multiplication. So, $I = prt$.

2-1 Writing Equations

Translate each equation into a sentence.

30. $j + 16 = 35$

SOLUTION:

Sample answer:

$$j + 16 = 35$$

The sum of j and 16 is thirty-five.

31. $4m = 52$

SOLUTION:

Sample answer:

$$4m = 52$$

Four times m is equal to fifty-two.

32. $7(p + 23) = 102$

SOLUTION:

Sample answer:

$$7(p + 23) = 102$$

Seven times the sum of p and twenty-three is the same as one hundred two.

33. $r^2 - 15 = t + 19$

SOLUTION:

Sample answer:

$$r^2 - 15 = t + 19$$

Fifteen less than the square of r equals the sum of t and nineteen.

2-1 Writing Equations

34. $\frac{2}{5}v + \frac{3}{4} = \frac{2}{3}x^2$

SOLUTION:

Sample answer:

$\frac{2}{5}v$	+	$\frac{3}{4}$	=	$\frac{2}{3}x^2$
Two fifths of v	plus	three fourths	is identical to	two thirds of x squared.

35. $\frac{1}{3} - \frac{4}{5}z = \frac{4}{3}y^3$

SOLUTION:

Sample answer:

$\frac{1}{3}$	-	$\frac{4}{5}z$	=	$\frac{4}{3}y^3$
One third	minus	four fifths of z	is	four thirds of y cubed.

Write a problem based on the given information.

36. q = quarts of strawberries; $2.50q = 10$

SOLUTION:

Allison is going to the market to buy some strawberries. Let the value q represent the number of quarts of strawberries. The value $2.50q$ represents the cost of the quarts. She has \$10. The strawberries cost \$2.50 for each quart. How many quarts can Allison buy?

37. p = the principal amount; $0.12p$ = the interest charged; $p + 0.12p = 224$

SOLUTION:

Ashley has a credit card that charges 12% interest on the principal balance. Then let value p represent the principal amount. The value $0.12p$ represents the interest charged. The sum of these values represents the payment amount. If Ashley's payment was \$224, what was the principal balance on the credit card?

2-1 Writing Equations

38. m = number of movies rented; $10 + 1.50m = 14.50$

SOLUTION:

m = number of movies rented; $10 + 1.50m = 14.50$

Barbara joined a video club that charged a one-time membership fee of \$10. Then let the value m represents the number of movies rented. She then paid \$1.50 for each movie that she rented. The value $1.50m$ represents the cost to rent m videos. The sum of these values represents a total cost of the membership fee and rental fee. If Barbara's first bill came to \$14.50, how many movies did she rent?

39. p = the number of players in the game; $5p + 7 =$ number of cards in a deck

SOLUTION:

Fred was teaching his friends a new card game. Let the value p represents the number of players in the game. Let $5p$ represent each player getting 5 cards. If 7 cards are placed in the center of the table, then $5p + 7$ represents to total number of cards in the deck. Since there are 52 cards in a deck, find how many players are in the game.

Match each sentence with an equation.

A. $g^2 = 2(g - 10)$

B. $\frac{1}{2}g + 32 = 15 + 6g$

C. $g^3 = 24g + 4$

D. $3g^2 = 30 + 9g$

40. One half of g plus thirty-two is as much as the sum of fifteen and six times g .

So, B is the correct answer.

SOLUTION:

One half of g	plus	thirty-two	is as much as	the sum of fifteen and six times g .
$\frac{1}{2}g$	+	32	=	$15 + 6g$

41. A number g to the third power is the same as the product of 24 and g plus 4.

SOLUTION:

A number g to the third power g^3	is the same as =	the product of 24 and g 24 g	plus +	4. 4
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So, C is the correct answer.

2-1 Writing Equations

42. The square of g is the same as two times the difference of g and 10.

SOLUTION:

The square of g is the same as two times the difference of g and 10.

$$g^2 = 2(g - 10)$$

So, A is the correct answer.

43. The product of 3 and the square of g equals the sum of thirty and the product of nine and g .

So, D is the correct answer.

SOLUTION:

The product of 3 and the square of g equals the sum of thirty and the product of nine and g .

$$3g^2 = 30 + 9g$$

44. **FINANCIAL LITERACY** Tim empties his bank, which contains quarters, dimes, and nickels. He has three more dimes than quarters and 6 fewer nickels than quarters. If he has 63 coins, write and solve an equation to find how many quarters Tim has.

SOLUTION:

Let q = the number of quarters, $3 + q$ = the number of dimes, and $q - 6$ = the number of nickels.

the number of quarters	plus	the number of dimes	plus	the number of nickels	equals	63
q	+	$3 + q$	+	$q - 6$	=	63

$$q + (3 + q) + (q - 6) = 63$$

$$3q - 3 = 63$$

$$3q = 66$$

$$q = 22$$

Tim has 22 quarters.

2-1 Writing Equations

45. **SHOPPING** Pilar bought 17 items for her camping trip, including tent stakes, packets of drink mix, and bottles of water. She bought 3 times as many packets of drink mix as tent stakes. She also bought 2 more bottles of water than tent stakes. Write and solve an equation to discover how many tent stakes she bought.

SOLUTION:

Let t = the number of tent stakes, $3t$ = the number of packets of drink mix, and $t + 2$ = the number of bottles of water.

17	equals	the number of tent stakes	plus	the number of packets of drink mix	plus	the number of bottles of water
17	=	t	+	$3t$	+	$t + 2$

$$17 = t + 3t + t + 2$$

$$17 = 5t + 2$$

$$15 = 5t$$

$$3 = t$$

Pilar bought 3 tent stakes.

2-1 Writing Equations

46. **MULTIPLE REPRESENTATIONS** In this problem, you will explore how to translate relations with powers.

x	2	3	4	5	6
y	5	10	17	26	37

- a. **VERBAL** Write a sentence to describe the relationship between x and y in the table.
 b. **ALGEBRAIC** Write an equation that represents the data in the table.
 c. **GRAPHICAL** Graph each ordered pair and draw the function. Describe the graph as *discrete* or *continuous*.

SOLUTION:

- a. Use the data in the table to find a relationship between x and y .

x	$x \cdot x + 1$	y
2	$2 \cdot 2 + 1$	5
3	$3 \cdot 3 + 1$	10
4	$4 \cdot 4 + 1$	17
5	$5 \cdot 5 + 1$	26
6	$6 \cdot 6 + 1$	37

The value of y is equal to the square of the x -value plus 1.

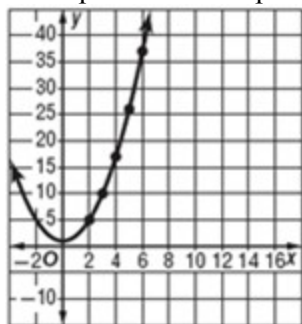
b.

The value of y is equal to the square of the x -value plus 1.

$$y = x^2 + 1$$

The equation is $y = x^2 + 1$.

- c. Graph the ordered pairs in the table. Connect the points with a smooth curve.



Because there are no breaks in the graph, the graph is continuous.

47. **OPEN ENDED** Write a problem about your favorite television show that uses the equation $x + 8 = 30$.

SOLUTION:

Write a problem about your favorite television show that uses the equation $x + 8 = 30$.

The value x represents the number of episodes for a television show. My favorite television show has 30 new episodes each year. So far eight have aired. Then $x + 8$ represents the number of shows this season. How many new episodes are left?

2-1 Writing Equations

48. **CCSS REASONING** The surface area of a three-dimensional object is the sum of the areas of the faces. If ℓ represents the length of the side of a cube, write a formula for the surface area of the cube.

SOLUTION:

Let S = surface area. A cube has 6 congruent square faces. To find the area of a square, multiply the length times the width. So, the area of one face is $\ell \cdot \ell$ or ℓ^2 . The surface area of the cube is the sum of the areas of the faces, which are equal, so the surface area is $\ell^2 + \ell^2 + \ell^2 + \ell^2 + \ell^2 + \ell^2$ or $6\ell^2$.

$$S = 6\ell^2$$

49. **CHALLENGE** Given the perimeter P and width w of a rectangle, write a formula to find the length ℓ .

SOLUTION:

The perimeter of a rectangle is equal to 2 times the length plus twice the width. So, the perimeter is equal to 2 times the sum of the length and width. The perimeter divided by 2 minus the width is equal to the length.

The perimeter divided by 2 minus the width

$$P \div 2 - w$$

is equal to the length

$$= \ell$$

$$\text{So, } \frac{P}{2} - w = \ell \text{ or } \ell = \frac{P - 2w}{2}.$$

50. **WRITING IN MATH** How can you translate a verbal sentence into an algebraic equation?

SOLUTION:

Sample answer: First, you should identify the unknown quantity or quantities for which you are trying to solve, and assign variables. Then, you should look for key words or phrases that can help you to determine operations that are being used. You can then write the equation using the numbers that you are given and the variables and operations that you assigned.

2-1 Writing Equations

51. Which equation *best* represents the relationship between the number of hours an electrician works h and the total charges c ?

Cost of Electrician	
Emergency House Call	\$30 one time fee
Rate	\$55/hour

- A** $c = 30 + 55$
B $c = 30h + 55$
C $c = 30 + 55h$
D $c = 30h + 55h$

SOLUTION:

total
charges

c

equals one time plus rate times number of
fee hours

$$= \$30 + \$55 \cdot h$$

So, $c = 30 + 55h$. Choice C is the correct answer.

52. A car traveled at 55 miles per hour for 2.5 hours and then at 65 miles per hour for 3 hours. How far did the car travel in all?
F 300.5 mi
G 305 mi
H 330 mi
J 332.5 mi

SOLUTION:

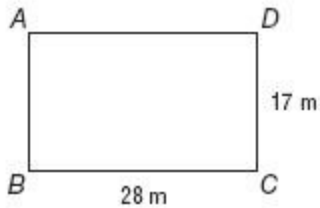
Let d = total distance traveled. To find how far the car traveled in all, find the sum of the products of the rates and the number of hours traveled at those rates.

$$\begin{aligned}d &= 55(2.5) + 65(3) \\ &= 137.5 + 195 \\ &= 332.5\end{aligned}$$

The car traveled 332.5 miles in all. Choice J is the correct answer.

2-1 Writing Equations

53. **SHORT RESPONSE** Suppose each dimension of rectangle $ABCD$ is doubled. What is the perimeter of the new $ABCD$?



SOLUTION:

To find the width and length of the new $ABCD$ multiply the width and length of rectangle $ABCD$ by 2. So, the length of the new $ABCD$ is $2 \cdot 28$ or 56 meters and the width of the new $ABCD$ is $2 \cdot 17$ or 34 meters. $P = 2\ell + 2w$, where P = perimeter, ℓ = length, and w = width.

$$\begin{aligned} P &= 2\ell + 2w \\ &= 2(56) + 2(34) \\ &= 112 + 68 \\ &= 180 \end{aligned}$$

The perimeter of the new $ABCD$ is 180 meters.

54. **STATISTICS** Stacy's first five science test scores were 95, 86, 83, 95, and 99. Which of the following is a true statement?
- A The mode is the same as the median.
 - B The median is the same as the mean.
 - C The range is the same as the mode.
 - D The mode is the same as the mean.

SOLUTION:

Find the mean, median, mode, and range of Stacy's first five science test scores.

$$\begin{aligned} \text{mean} &= \frac{95+86+83+95+99}{5} \\ &= \frac{458}{5} \\ &= 91.6 \end{aligned}$$

Order the numbers from least to greatest. {83, 86, 95, 95, 99}

The median, or middle number is 95.

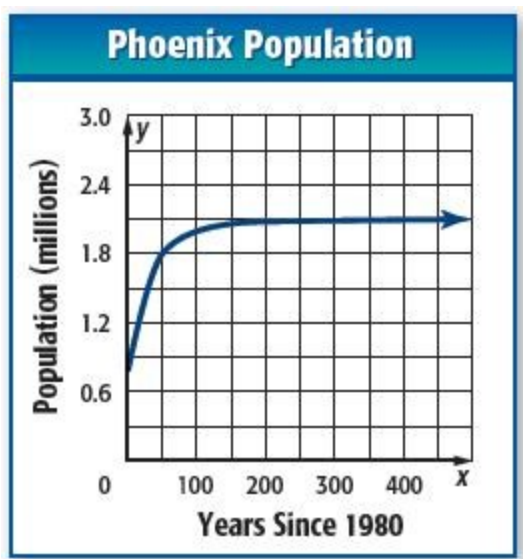
The number 95 appears most often, so the mode is 95.

The range is 16, since $99 - 83 = 16$.

The median is the same as the mode. So, Choice A is the correct answer.

2-1 Writing Equations

55. **POPULATION** Identify the function graphed as linear or nonlinear. Then estimate and interpret the intercepts of the graph, any symmetry, where the function is positive, negative, increasing, and decreasing, the x -coordinate of any relative extrema, and the end behavior of the graph.



SOLUTION:

Since the graph is a curve, not a line, the graph is nonlinear.

The graph intersects the y -axis at about $(0, 0.8)$, so the y -intercept is about 0.8. This means that the population of Phoenix was about 800,000 in 1980.

The graph has no symmetry.

The graph does not intersect the x -axis, so there is no x -intercept. This means that the population will always have a positive value.

The function lies above the x -axis, thus it is positive for all values of x .

The function is going up and is therefore increasing for all values of x .

The y -intercept is a relative minimum, so the population was at its lowest in 1980.

The end behavior for the function is described by: As x increases, y increases. As x decreases, y decreases.

2-1 Writing Equations

56. **SHOPPING** Cuties is having a sale on earrings.



- Make a table that shows the cost of buying 1 to 5 pairs of earrings.
- Write the data as a set of ordered pairs.
- Graph the data.

SOLUTION:

a.

Pairs of earrings	Total Cost
1	$1 \cdot \$29 = \29
2	$2 \cdot \$29 = \58
3	$2 \cdot \$29 = \58
4	$3 \cdot \$29 = \87
5	$4 \cdot \$29 = \116

- The ordered pairs are the number of pairs of earrings and the corresponding total cost. So, the ordered pairs are (1, 29), (2, 58), (3, 58), (4, 87), (5, 116).
- Graph the number of pairs of earrings on the x -axis and the total cost on the y -axis. Then, graph the ordered pairs.



2-1 Writing Equations

57. **GEOMETRY** Refer to the table below.

Polygon	Number of Sides	Interior Angle Sum
triangle	3	180
quadrilateral	4	360
pentagon	5	540
hexagon	6	720
heptagon	7	900

- Identify the independent and dependent variables.
- Identify the domain and range for this situation.
- State whether the function is *discrete* or *continuous*. Explain.

SOLUTION:

- The number of sides is the independent variable because it is independent of the interior angle sum. The interior angle sum is the dependent variable, because it is dependent on the number of sides.
- The domain is the input values of the function. In this case, the input values are the number of sides, or 3-7. The range is the output values of the function, or the interior angle sum, from 180 to 900, each multiples of 180. Therefore, the domain is all integers greater than or equal to 3, and the range is all positive integer multiples of 180.
- The function is discrete, because a polygon must have a whole number of sides. For example, there cannot be a polygon with 3.5 sides. So, the function cannot be continuous.

Evaluate each expression.

58. 9^2

SOLUTION:

$$\begin{aligned} 9^2 &= 9 \cdot 9 \\ &= 81 \end{aligned}$$

59. 10^6

SOLUTION:

$$\begin{aligned} 10^6 &= 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \\ &= 1,000,000 \end{aligned}$$

60. 3^5

SOLUTION:

$$\begin{aligned} 3^5 &= 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \\ &= 243 \end{aligned}$$

2-1 Writing Equations

61. 5^3

SOLUTION:

$$\begin{aligned} 5^3 &= 5 \cdot 5 \cdot 5 \\ &= 125 \end{aligned}$$