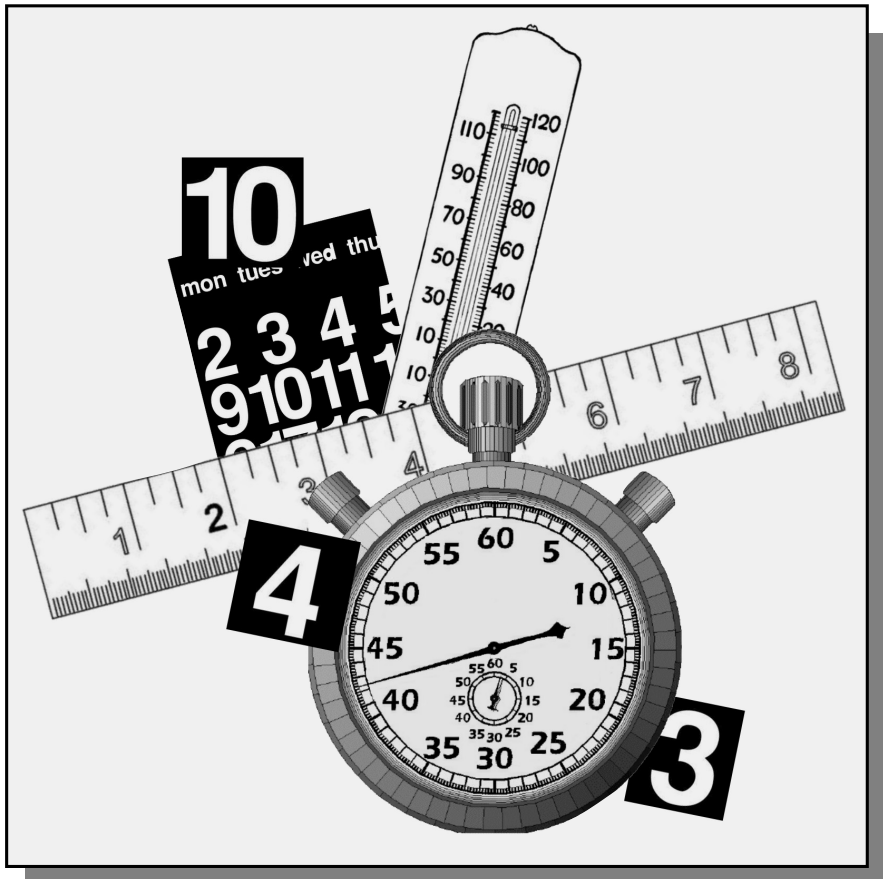
Intermediate Math Skills

Activities



Chapter 5

IMS: 76045 Revision: 030208

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Intermediate Math Skills

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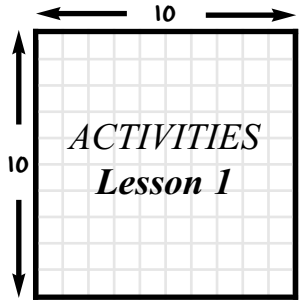
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Graphs

Relations



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Someone who is _____ to you is part of your family.

2. A relation means that there is a(n) _____ of some kind between two or more persons.

3. A mathematical _____ is defined as a set of ordered pairs, (x, y).

4. There is a connection between the two members of _____.

5. The connection between the members of an ordered pair is often determined by a(n) _____.

6. In the equation $y = x + 3$, y is considered a(n) _____ variable.

7. In the equation $y = x + 3$, x is the _____ variable.

8. x is considered independent because you can allow it to be any number that you choose. _____ (a) True or (b) False

9. The value of y depends on the value of x. _____ (a) True or (b) False

10. The set of values for the _____ variable, y, is called the ***range*** of the relation.

11. The set of values for the _____ variable, x, is known as the ***domain*** of the relation.

Refer to Example Set 1 to answer questions 12-16.

12. In Step 1, Professor K list the values of x and y in _____ order.

13. _____ means increasing or going up.

14. The values of x are 0, ____, 2, ____ and 5.

15. The values of y are _____, 3, _____, 6 and _____.

16. In Step 2, the _____, D, is {0, 1, 2, 3, 5}.

17. In Step 2, the _____, R, is {2, 3, 4, 6, 10}.

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Refer to Example Set 2 to answer questions 18-23.

18. In Step 1, the _____ value of x is 0.

19. The _____ value of x is 3.

20. The inequality in Step 1 that defines the domain is _____.

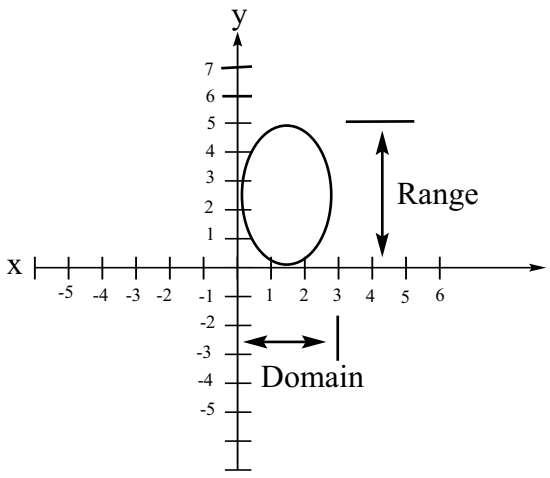
21. In Step 2, the _____ value of y is 0.

22. The _____ value of y is 4.

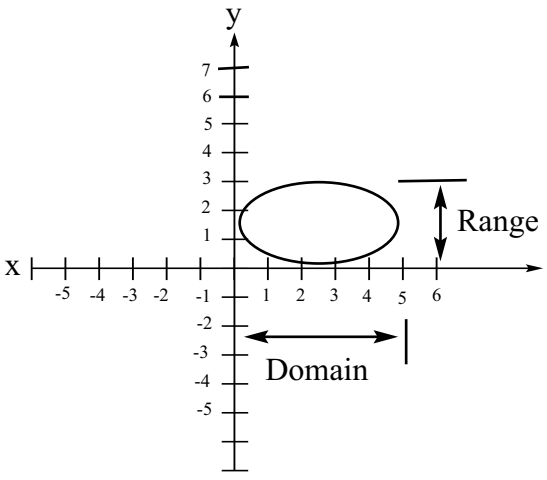
23. The inequality in Step 2 that defines the range is _____.

Using set-builder notation, determine the domain and range of the following graphs. (Refer to Example Set 2.)

24. Domain, D: _____
Range, R: _____



25. Domain, D: _____
Range, R: _____



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Refer to Example Set 3 to answer questions 26-30.

26. In Step 1, the minimum value of x is _____.

27. The maximum value of x is _____.

28. In Step 1, the inequality that represents the domain is _____.

29. In Step 2, the minimum value of y is _____.

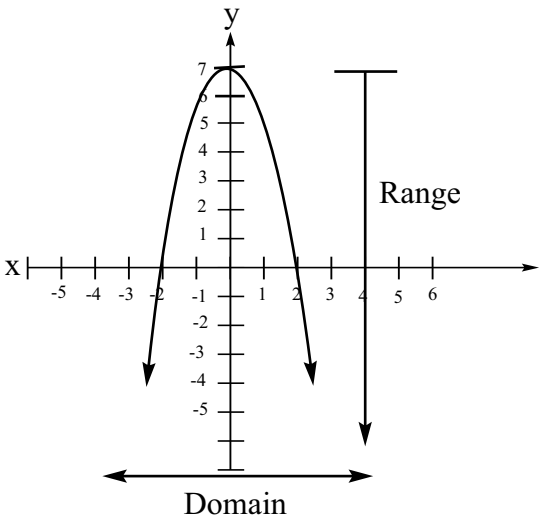
30. The maximum value of y is _____.

Using set-builder notation, determine the domain and range of the following graphs. (Refer to Example Set 3.)

31. What is the domain of the graph below? _____

(a) $\{x \mid -2 \leq x \leq 2\}$ (c) $\{x \mid -2 < x \leq 2\}$ (e) none of these

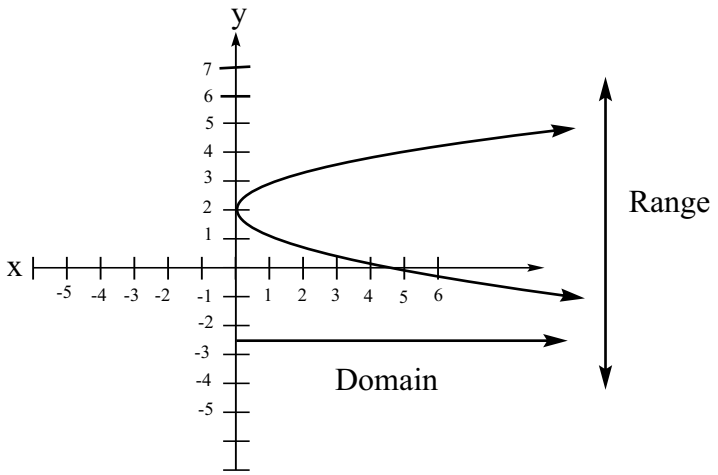
(b) $\{x \mid -2 < x < 2\}$ (d) $\{x \mid -2 \leq x < 2\}$



32. Determine the range of the graph below. _____

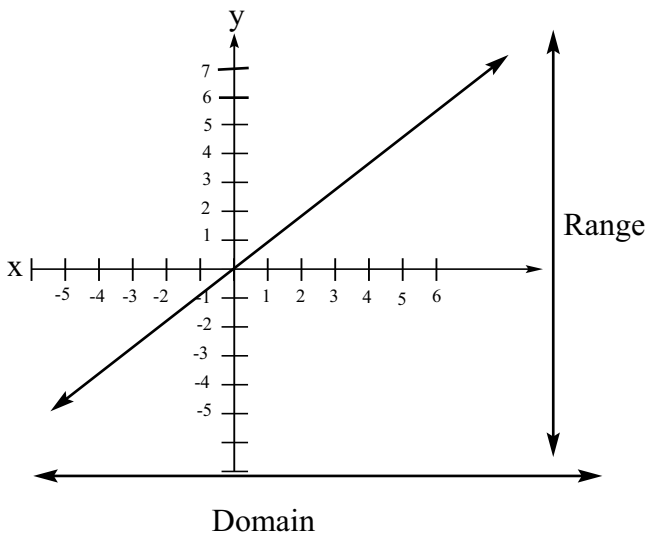
(a) $\{y \mid 0 \leq y < \infty\}$ (c) $\{y \mid -\infty < y < \infty\}$

(b) $\{y \mid \infty > y \geq 0\}$ (d) $\{y \mid -\infty \leq y \leq \infty\}$

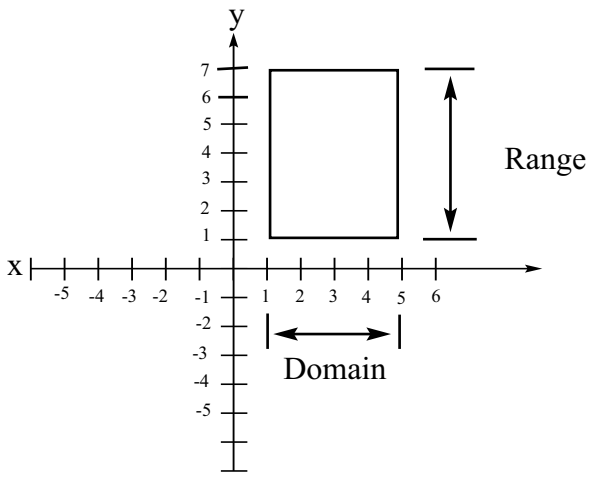


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33. Domain:, D: _____
Range, R: _____



34. Domain:, D: _____
Range, R: _____



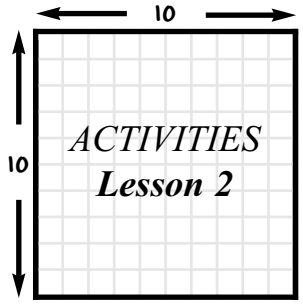
35. Write the **Life Principle**: "_____
_____."

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Graphs

Functions



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. _____ rules require you to use _____ for their designated purposes.

2. Some people use a(n) _____ to do a hammer's job.

3. A wrench was not designed as a(n) _____ to hit objects.

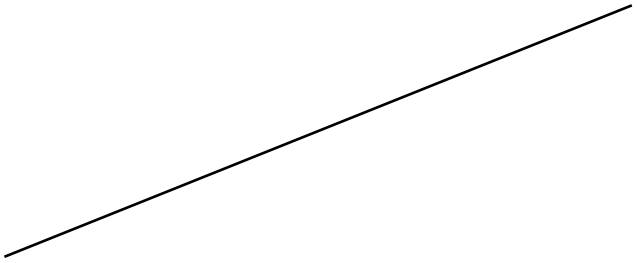
4. Mathematics has equations that are known as _____.

5. A ***function*** in mathematics is like a(n) _____ into which you put one number and get out one and only one number.

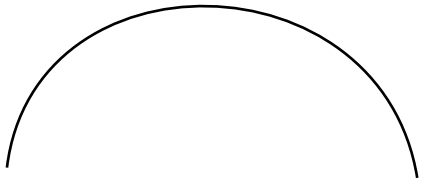
6. A function can also be represented by a certain type of line or curve on a(n) _____.

7. All of the graphs in Figure 2.1 are graphs of functions. _____
(a) True or (b) False

8. Does the line shown below represent a function? _____ (a) Yes or (b) No



9. Does the curve shown below represent a function? _____ (a) Yes or (b) No



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10. In Figure 2.2, each vertical line crosses each graph only _____.

11. No matter how many Vertical Line Tests are imposed through the curves in Figure 2.2, each vertical line will intersect the curve only _____.

12. The _____ is used to determine if an equation represents a function from the graph of that equation.

13. In Example Set 1, the drawing is a graph of a(n) _____.

14. The vertical line that Professor K drew in Example Set 1, intersected the graph of the ellipse _____ times.

15. The graph of an ***ellipse*** is _____ representative of a function.

16. In Example Set 2, Professor K _____ draw a vertical line that will intersect the graph more than once.

17. The curve in Example Set 2 does represent a(n) _____.

18. The _____ of two or more points cannot be the same in order for the equation to represent a function.

19. In Example Set 3, the abscissas of the ordered pairs of this set are _____, 5, and _____.

20. _____ of the abscissas are the same number.

21. In Example Set 3, Professor K has plotted the points on the _____ coordinate system.

22. Only _____ of the points is contained in any one of the vertical lines.

23. In the graph in Example Set 3, no two points are directly _____ each other. (a) above or beside (b) below or beside (c) above or below

24. The set of points shown in Example Set 3 represents a function. _____ (a) True or (b) False

Refer to Example Set 4 to answer questions 25-28.

25. The abscissas of the ordered pairs of this set are all _____.

26. The set of ordered pairs _____ represents a function.

27. The vertical line in the graph passes through _____ three points.

28. The graph shows that the set of ordered pairs _____ represents a function.

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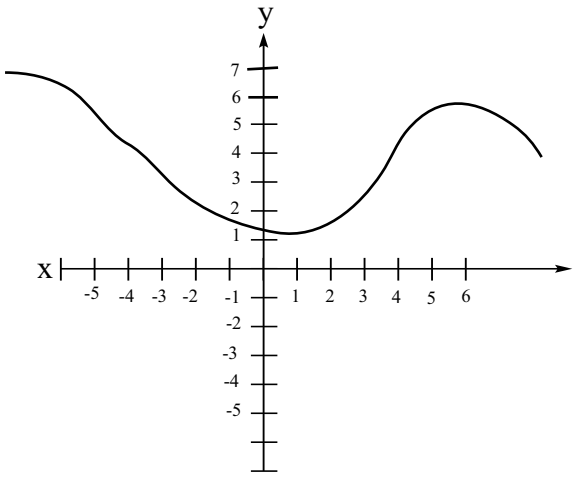
Determine if the following are representative of a function. Use the Vertical Line Test or the fact that the abscissas must be different to make your decision. Write "function" or "not a function" on the blank.

29. {(4, 8), (2, 9), (3, 7), (6, 2)} _____

30. {(3, 10), (4, 11), (5, 12), (6, 13), (3, 20)} _____

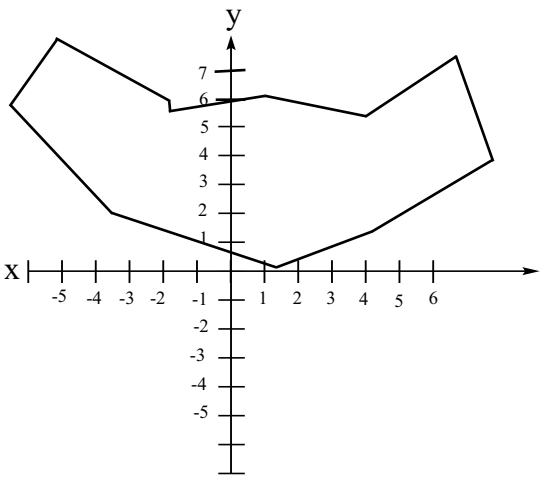
31. {(69, 70), (69, 50), (69, 45)} _____

32. _____

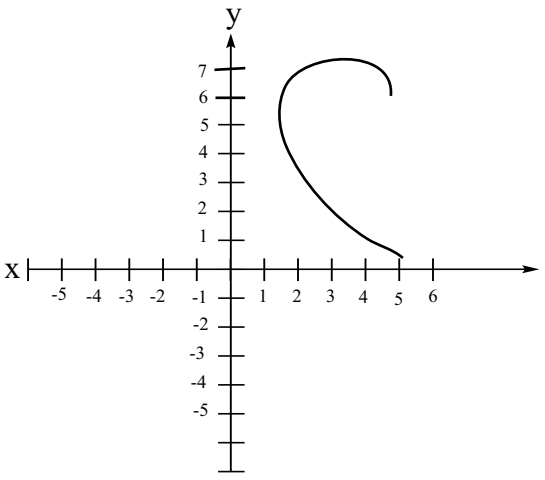


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33. _____



34. _____



35. Write the **Life Principle**: "_____
_____."

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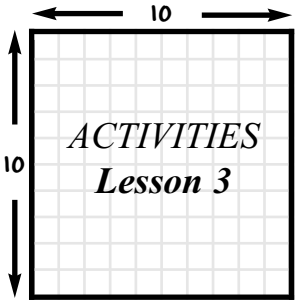
Name: _____

Date: _____ Grade: _____



Graphs

More Functions



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. A(n) _____ machine ***dispenses*** gumballs.

2. You must put _____ into the machine before a gumball will come out.

3. The _____ of a gumball machine was to dispense gumballs.

4. A function is a type of _____ machine.

5. You put one number into a(n) _____, and another number comes out.

6. An ***equation*** containing two variables is a number machine that produces a number when a _____ is substituted for one of the variables.

7. The expression for determining a term in a list of numbers is a(n) _____ machine.

8. If you put the number of the term into the number machine in #7, you get out the value of that _____.

Refer to Example Set 1 to answer questions 9-12.

9. The terms are increasing by _____.

10. The expression Professor K determined to be the expression for the *n*th term is _____.

11. The equation that is the number machine for the *n*th term in this case is _____.

12. The equation in #11 contains _____ variables (letters).

Refer to Example Set 2 to answer questions 13-16.

13. The function (number machine) for this example is _____=_____.

14. The inequality that represents the words, "all the values of *x* between 0 and 10," is _____.

15. In Step 1, Professor K substitutes the values of *x* into the equation and performs the calculations to obtain a corresponding value of _____ for each value of *x*.

16. In Step 2, Professor K wrote the solutions as _____.

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Refer to Example Set 3 to answer questions 17-20.

17. The inequality statement for the values of x is _____ (Step 1).

18. The numbers, -2 and 5 are included in the set of the values of x. _____
(a) True or (b) False

19. Professor K _____ the values of x into the equation and performs the calculations to obtain a corresponding value of y for each value of x.

20. Professor K writes the solutions as _____.

Calculate the values of y in each equation by using the values of x = -1, 0, 1, 2, 3, 4. Show your work and write your answers on the blank as ordered pairs.

21. $y = x + 5$ _____
(a) {(-1, 4), (0, 5), (1, 6), (2, 7), (3, 8), (4, 9)}
(b) {(-1, 3), (0, 4), (1, 5), (2, 6), (3, 7), (4, 8)}
(c) {(-1, 6), (0, 5), (1, 4), (2, 3), (3, 2), (4, 1)}
(d) {(-1, 0), (0, 1), (1, 2), (2, 3), (3, 4), (4, 5)}

22. $y = 2x - 2$ _____

23. $y = 3x + 4$ _____

24. $y = x - 10$ _____

25. $y = 5x - 5$ _____

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26. $y = x + 25$ _____

27. $y = 2x - 4$ _____

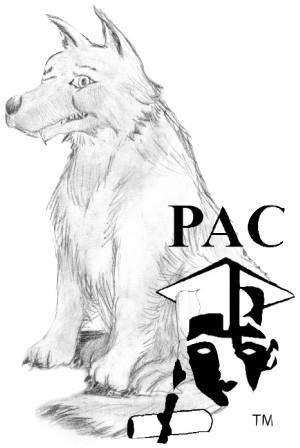
28. $y = 4x$ _____

(a) {(-4, -1), (0, 0), (4, 1), (8, 2), (12, 3), (16, 4)}
(b) {(-1, 3), (0, 0), (4, 1), (8, 2), (12, 3), (16, 4)}
(c) {(-1, -4), (0, 0), (1, 4), (2, 8), (3, 12), (4, 16)}
(d) {(-1, -4), (1, 1), (1, 4), (2, 8), (3, 12), (4, 16)}

29. $y = 30x$ _____

30. Write the **Life Principle**: "_____
_____."

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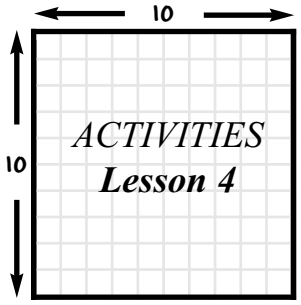
Name: _____

Date: _____ Grade: _____



Graphs

Graphing Functions



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. A picture is worth a(n) _____ words.

2. A ***graph*** is a picture of a(n) _____.

3. ***Functions*** are usually graphed on a Cartesian coordinate system or _____.

Refer to Example Set 1 to answer questions 4-8.

4. In Step 1, Professor K chose the numbers _____, _____, _____ as values of x.

5. Professor K substitutes the values that he chose for x into the equation $y =$ _____, _____ and _____.

6. In Step 2, Professor K placed the values that he determined in Step 1 into _____.

7. In Step 3, Professor K plotted the points on the _____.

8. Professor K then connected the points with a _____ line.
(a) horizontal (b) curved (c) straight

9. Only _____ points are necessary to draw a line.

10. Professor K plotted a third point to determine if he had drawn the line _____.

11. In a(n) _____ Test, a straight line passes through all the points in the solution, demonstrating that the line is drawn _____.

12. The equation, $y = x + 2$ is a(n) _____.

Refer to Example Set 2 to answer questions 13-16.

13. In Step 1, Professor K chose the numbers, _____, _____, _____ as values of x.

14. In Step 2, Professor K placed the values that he determined in Step 1 into _____ _____.

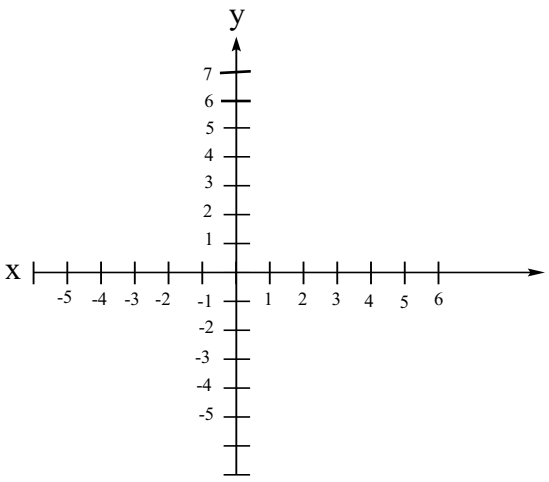
15. In Step 3, Professor K draws a straight line to _____ the points contained in the solution.

16. The graph of this equation shows that the equation represents a function because of the _____ Test.

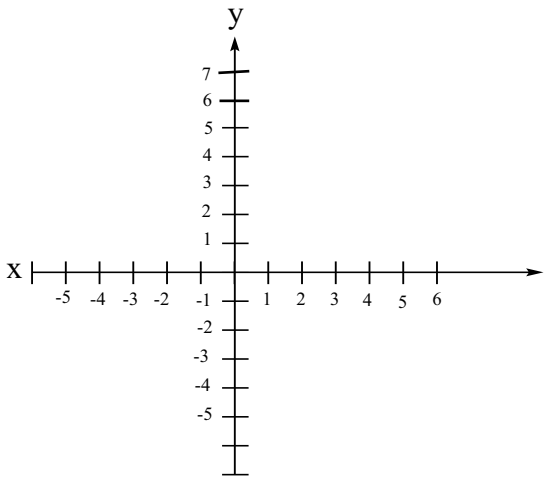
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Graph the following functions on the Cartesian coordinate plane. Remember to substitute values of *x* into the equations and calculate *y*. The easiest and most used values are: *x* = -2, -1, 0, 1, 2, 3. You may use other values if you wish.

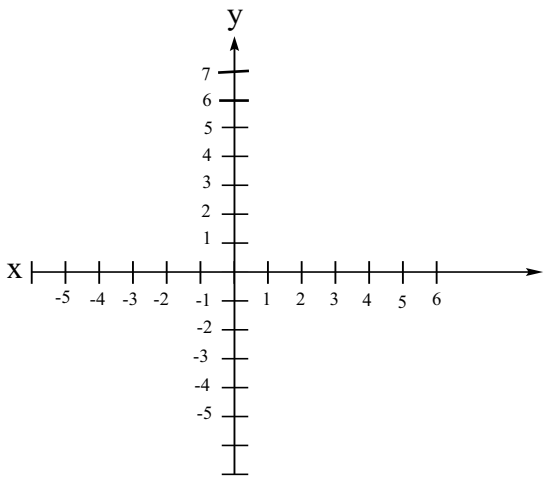
17. $y = x - 2$



18. $y = -x$

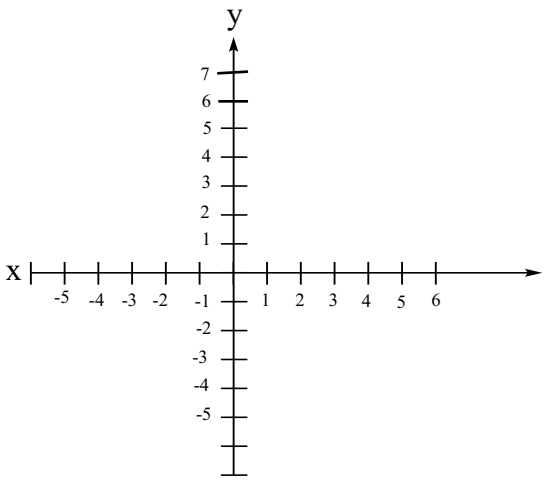


19. $y = 2x$

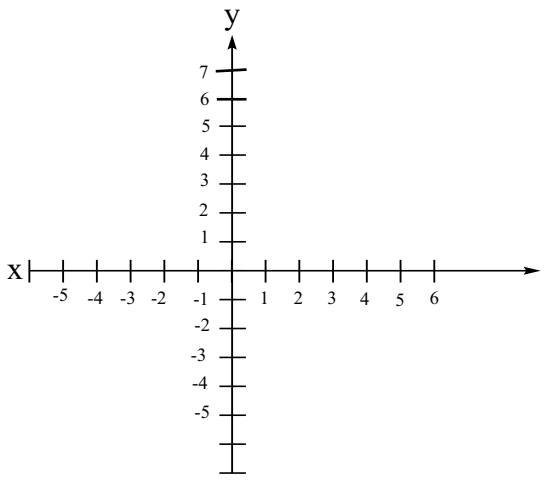


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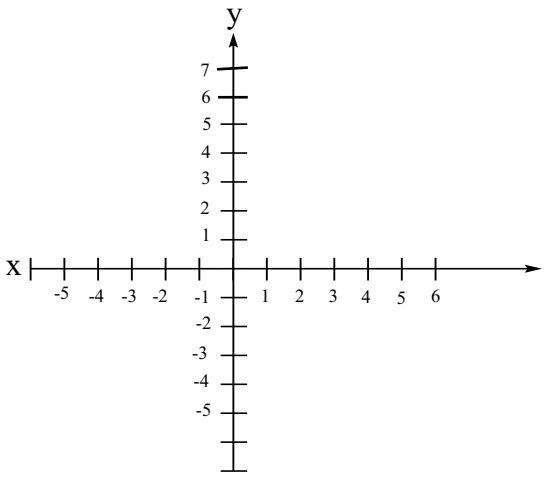
20. $y = -x + 3$



21. $y = -x + 1$

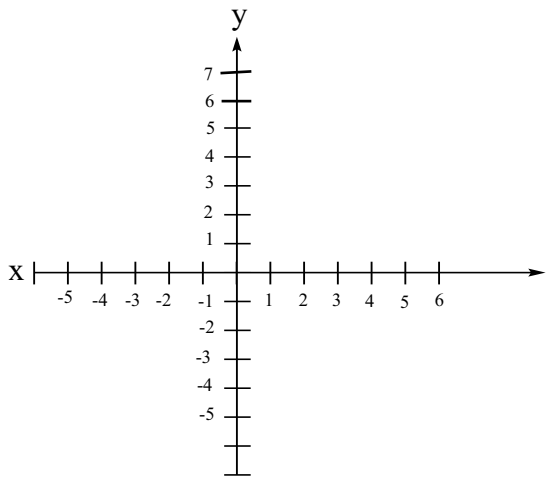


22. $y = -x - 1$

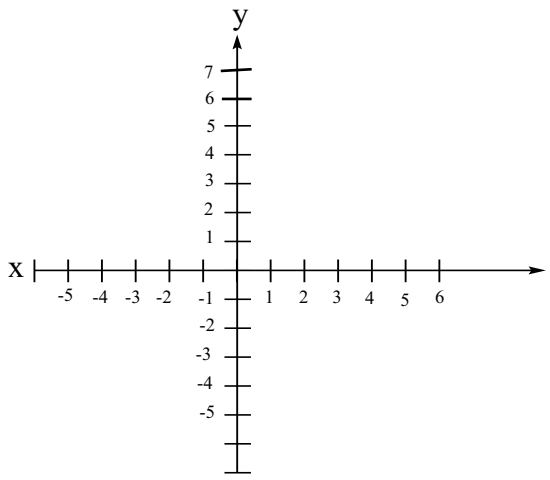


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23. $y = 2x + 1$

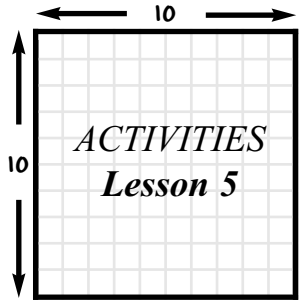


24. $y = 2x + 2$



25. Write the **Life Principle**: "_____
_____."

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Geometry

Other Relations

You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Relationships in mathematics may involve _____ or more ***components***.

2. The formula for determining the volume of a rectangular prism is_____.

3. A relationship of an equation containing three variables can be shown by using an _____.

4. An ordered pair is used when an equation contains _____ variables.

5. An ***ordered triplet*** is used when an equation contains _____ variables.

6. The formula for the volume of a rectangular prism contains _____ variables.

Refer to Example Set 1 to answer questions 7-11.

7. In Step 1, Professor K placed the volume of _____cubic feet into the formula.

8. In Step 2, Professor K chose the number two as the _____ in the formula.

9. In Step 3, Professor K chose the number two as the _____ in the formula.

10. In Step 3, Professor K calculated the _____ in the formula.

11. The ordered triplet for the possible length, width and height of the rectangular prism is _____.

Refer to Example Set 2 to answer questions 12-16.

12. The possible length of the prism is _____ units.

13. In Step 1, Professor K simplified the equation by _____ by four.

14. In Step 2, Professor K substituted the width, _____ into the equation.

15. In Step 2, Professor K determined the height to be _____ units.

16. Professor K determined that the ordered triplet, (4, 5, 10) is a possible solution for a rectangular prism of _____ cubic units.

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Determine a possible solution to the following problems involving ordered triplets. Show your work and place your answer on the blank as an ordered triplet.

17. $500 = x \bullet y \bullet z$ _____ (Hint: A number ending in zero or five can be divided by five. Pick 5 as the value for x.)

18. $2x \bullet y \bullet z = 232$ _____ (Hint: Even numbers can always be divided by 2.)

19. $2x \bullet 2y \bullet 2z = 8$ _____

(a) {(0, 0, 0)} (c) {(2, 2, 2)}
(b) {(1, 1, 0)} (d) {(1, 1, 1)}

20. $3a \bullet 2b \bullet c = 12$: Determine c, if the ordered triplet, (2, 1, c) solves the equation. _____

(a) {(1, 2, 1)} (c) {(1, 1, 2)} (e) all of these
(b) {(2, 1, 1)} (d) none of these

21. Johnny needs a box that is 7 inches in height and 4 inches wide. Determine the length of the box, if the box needs to contain a volume of 280 cubic inches. Write the answer as an ordered triplet: (l, h, w). _____

The ordered triplets below are solutions to $V = l \times h \times w$: (l, h, w). Determine the volume that each solution represents.

22. (12, 5, 4); V = _____

23. (30, 30, 10); V = _____

24. (15, 4, 20); V = _____

25. Write the **Life Principle**: "_____ _____."

Ask your teacher for the quiz over lessons 1-5 before proceeding to the next section.

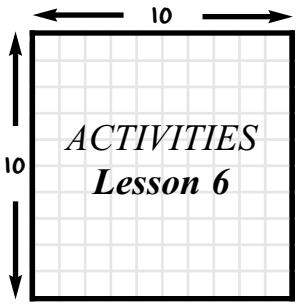
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Algebra



Polynomials

You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. _____ are agreements between two individuals or groups for one to supply some goods or services to the other for a specified price.

2. Some contracts consist of many _____ and conditions.

3. Mathematics has expressions with many _____ or parts.

4. _____ is a word used to describe something that has many names.

5. *Poly-* means _____.

6. *-nomial* means _____.

7. In mathematics, an algebraic expression of two or more terms that are _____ by addition or subtraction symbols is called a ***polynomial***.

8. A(n) _____ contains one term.

9. A ***binomial*** contains _____ terms.

10. A(n) _____ contains three terms.

11. $2a + 3b - 5c + d - f$ is an example of a polynomial of _____ terms.

Identify on the blank the following polynomials by writing the names given by mathematicians. (Refer to Example Set 1 for help in naming these polynomials.)

12. $23x$ _____

13. $x + 8$ _____

14. $3x - 4y + 25z$ _____

15. $a + 2b + 3c - 4d + 5e - 9f + 11g - 45$ _____

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Identify on each blank the names mathematicians have given to the following polynomials. (Refer to Example Set 2 for help in naming these polynomials.)

16. x _____

17. $5x + 4$ _____

18. $x + 8y + 3z$ _____

19. $7a - b + 10c + 2d - 6e + 14f + 21g + 7h + 8$ _____

Use what you have learned about identifying polynomials by writing on each blank the name mathematicians give each polynomial.

20. $2a + 3b - 5c + d$ _____

21. $4xy$ _____

22. $6x + 8$ _____

23. $3x - 7y + 24$ _____

24. $4w - 5x + 8y - 13z - 6$ _____

25. $a + b + c$ _____

26. 45 _____

27. $53x^2 + x - 5$ _____

28. $49x^3 - x^2 + 35x - 78$ _____

(a) monomial (c) trinomial (e) polynomial of four terms
(b) binomial (d) polynomial of three terms

29. $4a - b$ _____

(a) monomial (c) trinomial
(b) binomial (d) polynomial of a term

30. $5x^2y^3z$ _____

(a) monomial (c) polynomial of four terms
(b) binomial (d) can't tell

31. $x^2 + 2xy + y^2$ _____

32. $x^2 - y^2$ _____

33. Write the **Life Principle**: "_____
_____."

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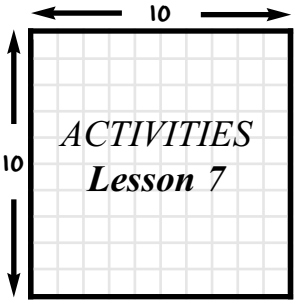
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Algebra

Binomials



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Two or more polynomials can be _____ together.

2. Simplification of the addition of polynomials is accomplished by combining _____ terms.

Refer to Example Set 1 to answer questions 3-7.

3. In Step 1, $2x + 4 + 3x + 9 = 2x + 3x + 4 + 9$ because of the _____ _____ of mathematics.

4. The Commutative Property states that $3 + 1 =$ _____.

5. In Step 2, Professor K combines _____ terms.

6. In Step 2, Professor K adds the _____.
(a) numerators (b) denominators (c) binomials (d) coefficients

7. $(2 + 3)x + (4 + 9) =$ _____

Refer to Example Set 2 to answer questions 8-10.

8. In Step 1, the _____ Property was used to rearrange the terms.

9. In Step 1, the coefficient of each x is the number, _____.

10. In Step 2, $x + x =$ _____ $= 2x$.

Refer to Example Set 3 to answer questions 11-13.

11. In Step 1, Professor K determined the sum of the ***binomials*** by dropping the _____.

12. In Step 2, Professor K combines ***like terms*** by _____ the coefficients.

13. $4x + x = (4 + 1)x =$ _____

Add the following polynomials. Show our work and write your answers on the blanks.

14. $(3x + 11) + (7x + 9) =$ _____

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15. $(11x + 7) + (4x + 10) =$ _____

16. $(21x + 40) + (39x + 19) =$ _____

17. $(x + 1) + (2x + 5) =$ _____
(a) $2x + 6$ (c) $6 + 3x$ (e) none of these
(b) $10x$ (d) $3x + 6$ (f) c or d

18. $(4x + 2) + (2x + 9) =$ _____
(a) $17x$ (c) $8x + 11$ (e) $6x + 11$
(b) $8x + 18$ (d) $6x + 18$ (f) none of these

19. $(x + 1) + (x + 1) =$ _____

20. $(5x + 5) + (5x + 5) =$ _____

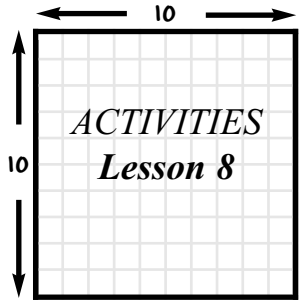
21. $(12x^2 + x) + (x^2 + x) =$ _____
(a) $13x^4 + 2x$ (c) $13x^2 + 2x$
(b) $15x^6$ (d) $13x^2 + x$

22. Write the **Life Principle**: "_____
_____."

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Name: _____

Date: _____ Grade: _____





Algebra

Add Bi- and Tri- nomials

You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. ***Dilemmas*** (complex problems) are like _____.

Refer to Example Set 1 to answer questions 2-4.

2. In Step 1, $5x - 6 + 6x - y + 8 = 5x +$ _____ $+ 8 - 6 - y$.

3. In Step 2, $5x + 6x = (5 + 6)x =$ _____.

4. Professor K ***determined*** _____ to be the trinomial sum of $(5x - 6)$ and $(6x - y + 8)$.

Refer to Example Set 2 to answer questions 5-8.

5. $(x + 5) + (3x - y + 9) = x + 5 + 3x -$ _____ $+ 9$.

6. Professor K used the _____ Property to rearrange the terms.

7. The generalized statement of the Commutative Property is a + b = _____.

8. $(x + 5) + (3x - y + 9) =$ _____ (final answer)

Refer to Example Set 3 to answer questions 9-11.

9. In Step 1, the _____ is dropped for simplification.

10. In Step 1, Professor K then uses the _____ Property to rearrange the terms.

11. $5x + x =$ _____$x = 6x$

Add the following binomials and trinomials. Show our work and write your answers on the blanks or choose the best answer.

12. $(15x - 4) + (x - 2y + 9) =$ _____

13. $(3x + 9) + (2x + 25y - 8) =$ _____

(a) $5x + 1 + 25y$ (c) $25y + 5x + 1$ (e) a, b or c

(b) $1 + 5x + 25y$ (d) none of these

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14. $(75x - 60) + (25x + 10y + 80) =$ _____

15. $(x + 1) + (x + y + 1) =$ _____

16. $(2x - 1) + (2x - y + 3) =$ _____

17. $(3a + 5) + (5a - b - 2) =$ _____

18. $(2x - y) + (x + 2y + z) =$ _____

19. $(4x + 1) + (5x + 5y + 5) =$ _____

20. $(20a + 10b) + (10a - 10b + 50) =$ _____

(a) $30a + 50$ (b) $30a + 20b + 50$ (c) $10a + 10b + 50$ (d) $30ab + 50$

21. Write the **Life Principle**: "_____
_____."

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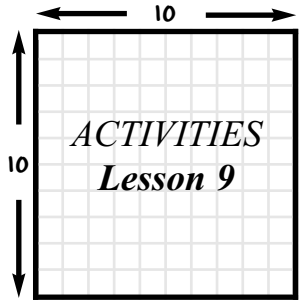
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Algebra

Add Trinomials



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The marriage illustration in the picture symbolizes two _____ becoming _____.

Refer to Example Set 1 to answer questions 2-7.

2. As in the examples in previous lessons, the terms can be rearranged by using the _____.

3. In Step 1, $(3a - 16b + 4c) + (2a - 2b - 4c) = 3a - 16b + 4c +$ _____ $- 2b - 4c$.

4. In Step 1, $3a - 16b + 4c + 2a - 2b - 4c = 3a + 2a - 16b - 2b +$ _____ $- 4c$.

5. In Step 2, $4c - 4c =$ _____ $= 0$

6. The sum of the two trinomials in this example is a _____.
(a) monomial (b) binomial (c) trinomial

7. The sum of the two trinomials in this example is _____.

Refer to Example Set 2 to answer questions 8-10.

8. In Step 1, $(4x - 6y + 4) + (6x - 2y + 7) =$ _____.

9. In Step 1, $4x - 6y + 4 + 6x - 2y + 7 =$ _____.

10. In Step 2, $(4 + 6)x + (- 6 - 2)y + (4 + 7) =$ _____.

Refer to Example Set 2 to answer questions 11-13.

11. In Step 1, the terms can be rearranged because of the _____ Property.

12. In Step 2, $2y - 2y =$ _____ $= 0$.

13. $7x + 0y + z =$ _____

Add the following trinomials. Show your work and write your answers on the blanks or choose the best answer.

14. $(6a + 6b + 6c) + (2a + 2b + 2c) =$ _____
(a) $24abc$ (b) $8a + 8b + 8c$ (c) $12a + 12b + 12c$ (d) $a + b + c$

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15. $(2a + 5b - 4c) + (3a - 4b + 7c) =$ _____

(a) $5a + 9b + 11c$ (b) $5a + b + 3c$ (c) $6a - 20b - 28c$ (d) $a + b + 3c$

16. $(2x + 7y + 4z) + (2x + 7y + 6z) =$ _____

17. $(9x + 4y + 2z) + (8x + 5y + 3z) =$ _____

18. $(12x + 6y + 14z) + (3x + 2y + 2z) =$ _____

19. $(5x + 2y + 4z) + (2x + 5y + 6z) =$ _____

20. $(x + y + z) + (x + y + z) =$ _____

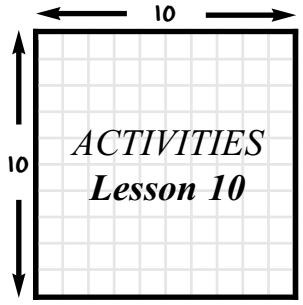
21. Write the **Life Principle**: "_____
_____."

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Algebra

Distributive Property



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The Distributive Property is used to _____ many various mathematical expressions.

2. The Distributive Property is an important _____ property.

3. Many algebraic expressions contain _____ symbols that separate numbers and variables in multiplication.

4. _____ means to put to use for a specific purpose.

Refer to Example Set 1 to answer questions 5-9.

5. In a), to simplify 4(3 + 2), Professor K multiplies the _____ times each number within the parentheses.

6. This is also the first step in the procedure known as _____, the acronym for Parentheses, Exponents, Multiplication, Division, Addition and Subtraction.

7. The simplification of 4(3 + 2) is an example of the Distributive Property across _____.

8. In b), Professor K simplifies 2(7 - 5) by multiplying the _____ times each number within the parentheses, in accordance with PEMDAS.

9. The simplification of 2(7 - 5) is an example of the Distributive Property across _____.

Simplify the following using the Distributive Property. Show your work in the space provided and write your answer on the blank (10-13).

10. 5(2 + 8) = _____

11. 3(3 + 4) = _____

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12. $2(4 - 1) =$ _____

13. $6(5 - 4) =$ _____

14. _____ means to be effective continually.

Refer to Example Set 2 to answer questions 15-20.

15. In this example, Professor K is simplifying _____ expressions.

16. In a), Professor K multiplies the 4 times each of the two _____, separated by an addition symbol, within the parentheses.

17. $4(x + 2) = 4 \bullet x +$ _____ $\bullet 2 = 4x + 8$

18. In b), Professor K simplifies the algebraic expression using the Distributive Property across _____.

19. $2(x - 5) =$ ____ $\bullet x -$ ____ $\bullet 5 = 2x -$ _____

20. Professor K cannot use PEMDAS here, even if he wanted to, because _____ and _____ cannot be combined.

Simplify the following algebraic expressions. Show your work and write your answer on the blank or choose the best answer.

21. $5(x + 9) =$ ____ $\bullet x +$ ____ $\bullet 9 = 5x \bullet 45$

22. $3(x - 8) = 3 \bullet x - 3 \bullet 8 =$ ____$x -$ _____

23. $2(x + 3)$ _____

(a) $2x + 3$ (b) $8x$ (c) $6x$ (d) $5x$ (e) $2x + 5$ (f) $2x + 6$

24. $4(x + 4)$ _____

(a) $8x$ (b) 16 (c) $4x + 4$ (d) $4x + 16$ (e) none of these

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25. 8(x + 5) _____

26. 2(x - 6) _____

27. 6(x - 3) _____

28. 3(x - 2) _____

29. 10(x + 2) _____

30. 2(x + 13) _____

31. 6(x - 6) _____

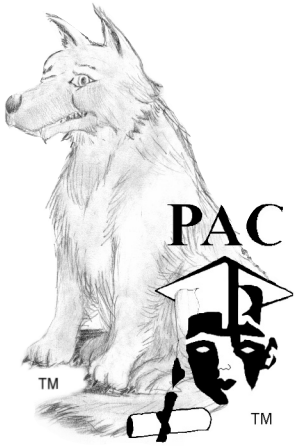
32. 3(x + 3) _____

33. Write the **Life Principle**: "_____
_____."

Ask your teacher for the quiz over lessons 6-10 before proceeding to the next section.



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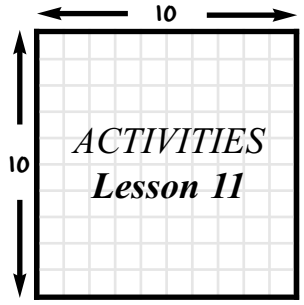
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Algebra

Distribute Fractions



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. To _____ means to put to a greater use.

2. The Distributive Property can be used to _____ fractions.

Refer to Example Set 1 to answer questions 3-8.

3. The numerator of the fraction is _____.

4. The denominator of the fraction is _____.

5. $3(x + 3) =$ ___ $\bullet\ x + 3 \bullet 3$

6. $3(x + 3) = 3x +$ _____

7. $5(x - 1) = 5 \bullet x -$ __ $\bullet\ 1$

8. $5(x - 1) =$ _____ $- 5$

Simplify the following fractions.

9. $\dfrac{2(x+2)}{3(x-2)}$ _____

(a) $^2/_3$ (b) $^4/_9$ (c) $\dfrac{2x+4}{3x-6}$ (d) $\dfrac{2x}{3x}$ (e) $\dfrac{6x}{-3x}$

10. $\dfrac{9(x+2)}{4(x+1)}$

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11. $\frac{2(x+7)}{8(x-3)}$

12. $\frac{5(x-3)}{6(x-2)}$

Refer to Example Set 2 to answer questions 13-17.

13. The numerator of the fraction is _____.

14. The denominator of the fraction is _____.

15. $2[3(x + 1) - 2] = 2[$ _____ $\bullet\ x + 3 \bullet 1 - 2]$

16. $2[3x + 1] = 2 \bullet 3x +$ _____ $\bullet\ 1$

17. $2[3x + 1] =$ ____ $x + 2$

Simplify the following fractions.

18. $\frac{3[2(x+1)-4]}{2[x(x-2)+x]}$ _____

(a) $\frac{6x-6}{2x^2-2x}$ (c) $\frac{24x}{x^2-x}$ (e) a or d

(b) $\frac{6x+18}{2x^2-x}$ (d) $\frac{6-6x}{2x-2x^2}$ (f) b or d

19. $\frac{4[3(x-1)+2]}{3[2(x-2)+2]}$

20. $\frac{2[5(x+1)-4]}{7[x(x-1)+x]}$

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21. $\frac{2[8(x+1)-3]}{5[x(x+1)+2]}$

22. $\frac{4[5(x+2)-4]}{3[x(x-2)+x]}$

23. $x \bullet x =$ _____

24. $-x + x =$ _____

25. Write the **Life Principle**: "_____
_____."

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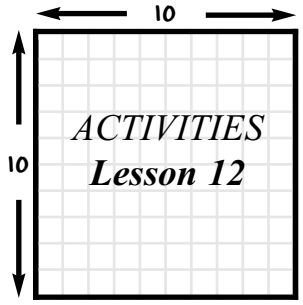
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Algebra

Subtract Binomials



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Many times people do the opposite of what they _____ to do.

2. Signing a ***contract*** is the same as making a written _____.

3. Ancient Hebrew writings proclaimed that a person should not make a _____ that he will not keep.

4. A ***vow*** is a(n) _____ promise.

5. _____ is the opposite of addition.

6. Binomials can be added or _____.

Refer to Example Set 1 to answer questions 7-10.

7. In Step 1a, $- (3x + 2) =$ _____.

8. In Step 1a, a negative _____ is understood to be in front of the parentheses.

9. Like terms are terms containing the _____ variable.

10. $(8x + 4) - (3x + 2) =$ _____ (final answer)

Refer to Example Set 2 to answer questions 11-12.

11. In Step 1a, $-(2x + 1) = -1(2x + 1) =$ _____ $\bullet\ 2x +$ _____ $\bullet\ 1$.

12. In Step 2, $6x - 2x + 2 - 1 = (6 - 2)x + (2 - 1) =$ _____.

Refer to Example Set 3 to answer questions 13-16.

13. In Step 1a, $-(3x - 3) = -1(3x - 3) = -1 \bullet 3x + (-1) \bullet (-3) =$ _____.

14. In Step 2, $7x - 3x + 2 + 3 = (7 - 3)x + (2 + 3) =$ _____.

15. Professor K combined like terms by _____ the ***coefficients***. Their difference is _____.

16. In this example, Professor K used one rule of signs that states that negative times negative equals _____.

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Subtract the following binomials. Show your work. Write the answer on the blank or select the correct response.

17. $(9x + 3) - (2x + 2) =$ _____

(a) $11x + 5$ (c) $7x + 1$

(b) $7x - 1$ (d) $7x + 5$

18. $(3x + 5) - (2x + 4) =$ _____

19. $(5x + 6) - (3x + 5) =$ _____

20. $(12x - 5) - (6x - 6) =$ _____

(a) $6x - 1$ (c) $6x - 11$

(b) $6x + 1$ (d) $18 - 11$

21. $(7x - 2) - (6x - 5) =$ _____

22. $(25x - 26) - (15x - 22) =$ _____

23. $(6a + 10b) - (3a + 5b) =$ _____

24. $(13a + 3b) - (11a + b) =$ _____

25. Write the **Life Principle**: "_____
_____."

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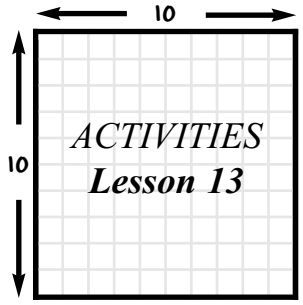
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Algebra

Subtract Trinomials



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. _____ is the opposite of addition.

2. ***Polynomials*** can be added or _____.

Refer to Example Set 1 to answer questions 3-6.

3. In Step 1, Professor K used the Commutative Property to _____ the terms.

4. In Step 1a, $-(5x - y - 8) = -1(5x - y - 8) = -1 \bullet 5x - (-1) \bullet y - (-1) \bullet 8 =$ _____.

5. In Step 2, $15x - 5x =$ _____.

6. $(15x - 7) - (5x - y - 8) =$ _____ (final answer)

Refer to Example Set 2 to answer questions 7-10.

7. In Step 1a, a negative _____ is understood to be in front of the parentheses.

8. Like terms are terms containing the same _____ (such as x) along with their numbers, known as _____.

9. In Step 2, $2x - x =$ _____$= x$.

10. $(2x + 3y + 5) - (x - 6) =$ _____ (final answer)

Subtract the following binomials and trinomials. Show your work. Write the answer on the blank or select the correct response.

11. $(9x + 3) - (2x - 5y + 2) =$ _____

(a) $7x + 5y + 1$ (b) $7x - 5y + 5$ (c) $18x - 5y + 6$ (d) $7x + 5y + 5$

12. $(3x + 5) - (2x + 4y + 4) =$ _____

(a) $5x + 4y + 9$ (b) $x + y + 9$ (c) $5x + 9y - 4$ (d) $6x + 4y + 1$ (e) none of these

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13. $(5x + 5) - (3x - 5y + 5) =$ _____

14. $(12x - 5) - (6x - 2y - 6) =$ _____

15. $(7x - 2) - (6x - 4y - 5) =$ _____

16. $(25x - 26) - (15x - 10y - 22) =$ _____

17. $(6a + 10b + 4c) - (3a + 5b) =$ _____

18. $(13a + 3b + 4c) - (11a + 3c) =$ _____

19. $(9a + 9b + 9c) - (3a + 5b) =$ _____

20. Write the **Life Principle**: "_____
_____."

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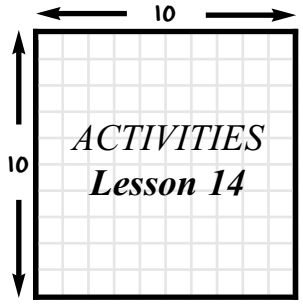
Name: _____

Date: _____ Grade: _____



Algebra

Subtract More Trinomials



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. According to the text of this lesson, ***trinomials*** can be _____ or subtracted.
(a) added (b) multiplied (c) divided (d) all of these

Refer to Example Set 1 to answer questions 2-6.

2. In Step 1a, $-(2a + 5b + 5c) = -1(2a + 5b + 5c) = -1 \bullet 2a + (-1) \bullet 5b + (-1) \bullet 5c =$ _____.

3. In Step 1a, a negative _____ is understood to be in front of the parentheses.

4. Like terms are rearranged in Step 1, using the _____.

5. In Step 2, $12b - 5b =$ _____ $= 7b$.

6. $(5a + 12b + 8c) - (2a + 5b + 5c) =$ _____ (final answer)

Refer to Example Set 2 to answer questions 7-10.

7. In Step 1, Professor K _____ the parentheses and then rearranged the terms.

8. In Step 1a, Professor K distributed the negative one into $2x + y + 3$ by multiplying each term by _____.

9. In Step 2, $6x - 2x = 4x$ and $2y - y =$ _____.

10. In Step 3, $(4 - 3) =$ _____.

Subtract the following trinomials. Show your work. Write the answer on the blank, or select the correct response.

11. $(9x + y + 3) - (2x + y + 2) =$ _____
(a) $9x + 1$ (b) $9x - 2y - 1$ (c) $7x - y + 1$ (d) $7x + 1$

12. $(3x^2 + x + 5) - (2x^2 + x + 4) =$ _____
(a) $x^2 - 2x + 1$ (b) $x^2 + 2x + 9x$ (c) $5x^2 + 1$ (d) $x^2 + 1$

13. $(5a + 3b + 6) - (3a + 2b + 5) =$ _____

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14. $(15x - y - 7) - (5x - y - 8) =$ _____

15. $(12x - 5y + z) - (6x - 2y - 6z) =$ _____

16. $(7a - 3b + c) - (6a - 4b - 5c) =$ _____

17. $(25x - 26y - 20) - (15x - 10y - 22) =$ _____

18. $(6a + 10b + 4c) - (3a + 5b + 2c) =$ _____

19. $(13a + 3b + 4c) - (11a + b + 3c) =$ _____

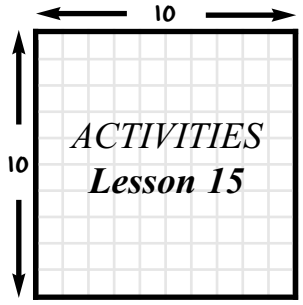
20. Write the **Life Principle**: "_____
_____."

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Algebra

Add & Subtract Polys



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Polynomials beyond the _____ level are referred to as ***polynomials of four*** (or more) ***terms***.

Refer to Example Set 1 to answer questions 2-5.

2. In Step 1, Professor K dropped the parentheses and rearranged the terms using the _____ Property.

3. In Step 2, $8x^3 + 3x^3 =$ _____ $= 11x^3$.

4. In Step 2, $3x^2 + 2x^2 = (3 + 2)x^2 =$ _____.

5. In Step 2, $(8x^3 + 3x^2 + x + 4) + (3x^3 + 2x^2 + 4x + 2) =$ _____ (final answer).

Add the following polynomials.

6. $(4a + 5b + c + 3d) + (3a + 4b + 2c + d) =$ _____

(a) $23abcd$ (c) $4d + 3c + 9b + 8a$

(b) $8a + 9b + 3c + 4d$ (d) $7a + 9b + 3c + 4d$

7. $(2a + 3b + 4c + 5d) + (a + 2b + 3c + 4d) =$ _____

8. $(4x + 3y + 2z + 1) + (3x + 2y + z + 1) =$ _____

(a) $12x + 6y + 2z + 2$ (c) $6x + 5y + 3z + 1$

(b) $7x + 5y + 3z + 2$ (d) $x + y + z$

9. $(14x + 15y + 10z + 3) + (30x + 15y + 20z + 7) =$ _____

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Refer to Example Set 2 to answer questions 10-16.

10. In this example, Professor K is determining the _____ of two polynomials of four terms.

11. In Step 1a, Professor K distributes the negative one into $3x^3 + 2x^2 + 4x + 2$ by multiplying each term by _____.

12. In Step 1a, $-1(3x^3 + 2x^2 + 4x + 2) =$ _____

13. In Step 2, $8x^3 - 3x^3 =$ _____ $= 5x^3$

14. In Step 2, $3x^2 - 2x^2 =$ _____ $= x^2$

15. In Step 2, $x - 4x =$ _____ $= -3x$.

16. In Step 2, $(8x^3 + 3x^2 + x + 4) - (3x^3 + 2x^2 + 4x + 2) =$ _____ (final answer).

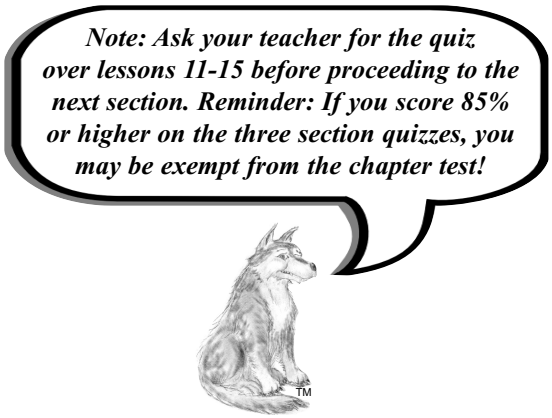
Subtract the following binomials. Show your work and write the answer on the blank.

17. $(9x^3 + 3x^2 + x - 1) - (6x^3 + 2x^2 - 2x + 2) =$ _____

18. $(4a + 5b + 6c + 3d) - (3a + 4b + 2c + 2d) =$ _____

19. $(5x^5 + 2x^4 + 3x^3 + 3) - (3x^5 + x^4 + 2x^3 + 2) =$ _____

20. Write the **Life Principle**: "_____ _____."



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Intermediate Math Skills

Mathematics Charts

LENGTH - ENGLISH SYSTEM

12 inches	=	1 foot
3 feet	=	1 yard
5.5 yards	=	1 rod
320 rods	=	1 mile
1,760 yards	=	1 mile
5,280 feet	=	1 mile

VOLUME - ENGLISH SYSTEM

1 tablespoon, Tbsp, T	=	3 teaspoons, tsp
1 cup, c	=	16 tablespoons, Tbsp, T
1 pint, pt	=	2 cups, c
1 quart, qt	=	2 pints, pts
1 gallon, gal	=	4 quarts, qts

WEIGHT - ENGLISH SYSTEM

1 pound, lb	=	16 ounces, oz
1 hundredweight, cwt	=	100 pounds, lbs
1 ton	=	20 hundredweight, cwt
1 ton	=	2000 pounds, lbs

LENGTH - METRIC SYSTEM

1 meter	=	1,000 millimeters
1 meter	=	100 centimeters
1 kilometer	=	1,000 meters
1 centimeter	=	10 millimeters

VOLUME - METRIC SYSTEM

1 liter	=	1,000 milliliters
1 liter	=	100 centiliters
1 kiloliter	=	1,000 liters
1 centiliter	=	10 milliliters

WEIGHT - METRIC SYSTEM

1 gram	=	1,000 milligrams
1 gram	=	100 centigrams
1 kilogram	=	1,000 grams
1 centigram	=	10 milligrams

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PERFECT SQUARES

$\sqrt{1}=1$	$\sqrt{25}=5$	$\sqrt{81}=9$	$\sqrt{169}=13$
$\sqrt{4}=2$	$\sqrt{36}=6$	$\sqrt{100}=10$	$\sqrt{196}=14$
$\sqrt{9}=3$	$\sqrt{49}=7$	$\sqrt{121}=11$	$\sqrt{225}=15$
$\sqrt{16}=4$	$\sqrt{64}=8$	$\sqrt{144}=12$	$\sqrt{256}=16$

PERFECT CUBES

$\sqrt[3]{1}=1$	$\sqrt[3]{-8}=-2$	$\sqrt[3]{64}=4$	$\sqrt[3]{-125}=-5$
$\sqrt[3]{-1}=-1$	$\sqrt[3]{27}=3$	$\sqrt[3]{-64}=-4$	$\sqrt[3]{216}=6$
$\sqrt[3]{8}=2$	$\sqrt[3]{-27}=-3$	$\sqrt[3]{125}=5$	$\sqrt[3]{-216}=-6$

$$P = \frac{\text{the number of elements in the set containing favorable outcomes}}{\text{the number of elements in the sample set}}$$

$$Midpoint = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

FORMULAS

Surface Area	Area	Volume	Perimeter/ Circumference	Others
Sphere: $A_s = 4\pi r^2$	**Triangle:** $A = {}^1\!/_2 bh$	**Sphere:** $V = {}^4\!/_3 \pi r^3$	**Perimeter of a Rectangle:** $P = 2w + 2l$	**Pythagorean Theorem:** $c^2 = a^2 + b^2$
Cylinder: $A_s = 2\pi rh + 2\pi r^2$	**Rectangle:** $A = l \times w$	**Cone:** $V = {}^1\!/_3 \pi r^2 h$	**Circumference of a Circle:** $C = 2\pi r$ or $C = \pi d$	**Convert to Fahrenheit:** $F = {}^9\!/_5 C + 32$
Cube: $A_s = 6s^2$	**Circle:** $A = \pi r^2$	**Rectangular Prism:** $V = l \times w \times h$		**Convert to Celsius:** $C = {}^5\!/_9 (F - 32)$
Lateral Surface Area of a Cone: $A_{ls} = \pi rl$	**Trapezoid:** $A = {}^1\!/_2 (b_1 + b_2)h$	**Square Pyramid:** $V = ({}^1\!/_3) lwh$		**Distance:** $d = r \bullet t$
		Triangular Prism: $V = {}^1\!/_2 bhl$		**Slope:** $y = mx = b$
		Cylinder: $V = \pi r^2 h$		**Simple Interest:** $I = prt$

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Mathematics Charts

TIME CONVERSIONS

1 week = 7 days
1 year = 12 months

CONVERSIONS

English to Metric	
1 ounce (oz)	28.35 grams (g)
1 pound (lb)	454 grams (g)
1 ton (T)	907.2 kilograms (kg)

Metric to English	
1 gram (g)	.035 ounce (oz)
1 kilogram (kg)	2.2 pounds (lb)
1 metric ton (mt)	2200 pounds (lb)

English to Metric	
1 cubic inch	16.39 cubic cm
1 gallon	3.785 liters
1 cubic foot	28.316 liters
1 quart	.946 liters

Metric to English	
1 cubic cm	.061 cubic inch
1 cubic meter	35.315 cubic feet
1 liter	1.05 quarts
1 liter	.264 gallon

English to Metric	
1 inch	2.54 cm
1 foot	0.3048 meter
1 yard	0.9144 meter
1 mile	1.6 km

Metric to English	
1 centimeter	0.3937 in.
1 meter	39.37 in.
1 meter	1.09 yds
1 kilometer	0.6213 mile

AREA CONVERSIONS

1 square centimeter = 0.155000 sq in.
1 square meter = 10.763910 sq ft
1 square inch = 645.16 sq mm
1 square foot = 0.09290304 sq meter
1 square yard = 0.836127 sq meter
1 square foot = 144 sq in.

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