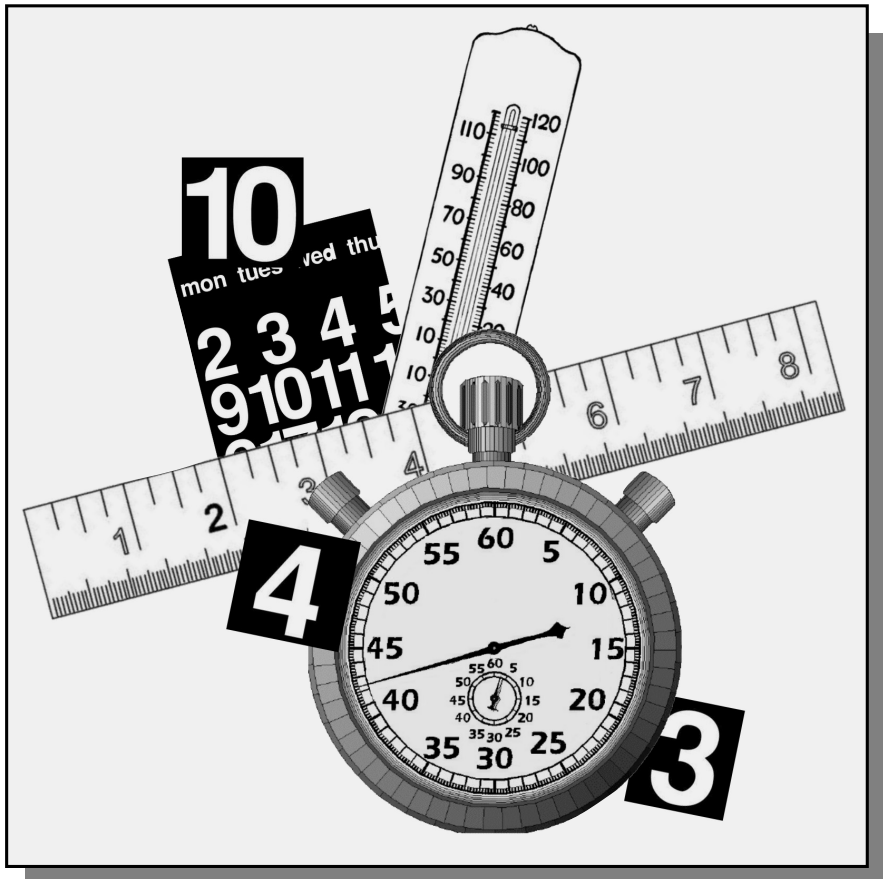
Basic Math Skills

Activities



Chapter 4

BMS: 76038 Revision: 030208

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Basic Math Skills

Chapter 4

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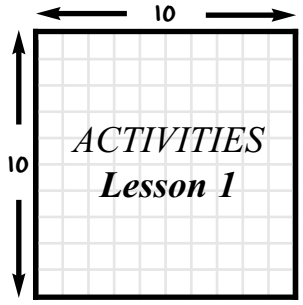
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Geometry

Shapes

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. Throughout history, families and countries have used shapes for their family _____ and _____.

2. Ships relay specific messages by the _____ and color of flags.

3. A significant use of a ***line*** was at the _____ where Colonel Travis drew a line in the sand.

4. Columbus understood that the Earth was in the shape of a(n) _____.

5. A(n) _____ sign has eight sides.

6. The Sun and Moon appear to be _____ of light in the sky.

7. The trunks of trees are in the shape of _____.

8. The shortest distance between ***points*** is a(n) _____.

9. Building structures containing _____ gives the structure stability.

10. In ancient times people who lived in _____ and _____ thought they could explain nature with lines, squares and ***angles***.

11. Priest of these cultures were required to study _____.

12. Paintings from the _____ period included squares, rectangles, and lines.

13. A building must have a strong _____ in order to stand.

14. Most geometric shapes consist of _____.

15. A _____ is drawn between two points and continues indefinitely through those points in each direction.

16. A line consists of a(n) _____ number of points.

17. A(n) _____ is the portion of a line between two points.

18. The point at the end of a ***line segment*** is called a(n) _____.

19. The place where two lines intersect is called a(n) _____.

20. To run along side of something means to run _____ to it.

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21. ***Parallel*** lines have no _____ of _____.

22. A line that ***intersects*** two parallel lines is called a _____.

23. A(n) _____ is part of a line.

24. A ***ray*** has _____ endpoint.

25. Intersecting lines form _____.

26. Most geometric shapes contain _____ formed by lines.

27. The symbol for *angle* is _____.

28. _____ points name an angle.

29. The measure or size of a ***right angle*** is _____.

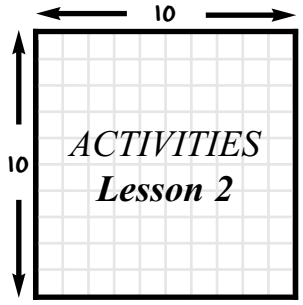
30. If an angle is less than 90° it is called a(n) _____ angle.

31. A(n) _____ angle has a measurement of more than 90°.

32. A(n) _____ angle has a measurement of 180° and forms a straight line.

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

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Geometry

Triangles

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. Braces used in the construction of buildings are often in the shape of _____.

2. A geometric figure with three sides and three angles is called a(n) _____.

3. A ***triangle*** that contains a 90° angle is called a(n) _____ triangle.

4. A triangle that contains an angle whose measure is greater than 90° is called a(n) _____ triangle.

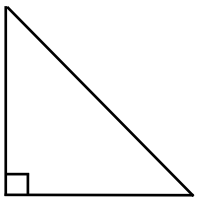
5. An ***acute*** triangle is a triangle containing angles whose measures are _____ than 90°.

6. If two sides and two angles of a triangle are equal the triangle is a(n) _____ triangle.

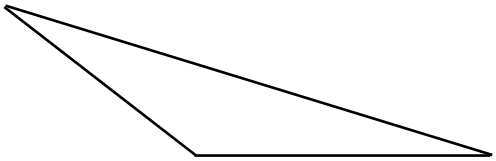
7. In an ***equilateral*** triangle the lengths of the sides are _____ and the measures of the three angles are _____.

Write the name of the triangle on the blank beside the triangle.

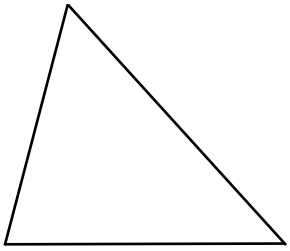
8. _____



9. _____

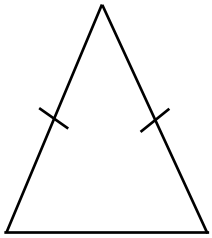


10. _____

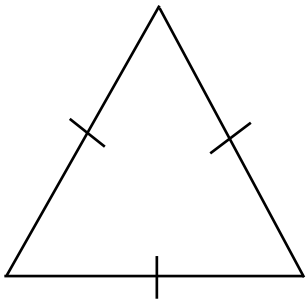


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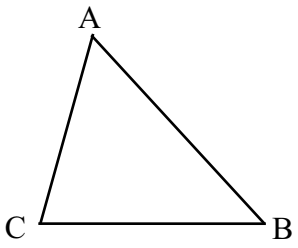
11. _____



12. _____

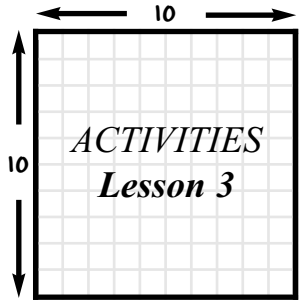


13. In the triangle shown, the vertex of ∠ABC is the point _____.



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

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Geometry

Polygons

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 multi-sided geometric figure is called a(n) _____.

2. A ***polygon*** is a(n) _____ shape with more than two sides.

3. Polygons are named according to the _____ of sides of the polygon.

4. Prefixes used to name polygons are derived from _____ roots.

Match the following prefixes to their meanings by writing the appropriate letter on the blank beside the prefix.

5. _____ penta- (a) three

6. _____ nona- (b) nine

7. _____ tri- (c) five

8. _____ hexa- (d) four

9. _____ quadri- (e) ten

10. _____ deca- (f) six

Match the following polygons to the number of sides they contain by writing the appropriate letter on the blank beside the polygon.

11. _____ pentagon (a) three

12. _____ heptagon (b) eight

13. _____ triangle (c) five

14. _____ octagon (d) four

15. _____ hexagon (e) six

16. _____ quadrilateral (f) seven

Fill in the blanks.

17. A four-sided polygon with opposite sides parallel is called a(n) _____.

18. ∥ means _____.

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19. The four angles in a rectangle have a measurement of _____ each.

20. A sheet of _____ paper is in the shape of a ***rectangle***.

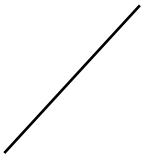
21. A _____ is a rectangle with all sides of equal length.

22. The case for a CD is in the shape of a(n) _____.

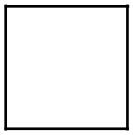
23. A(n) _____ is a geometric figure in which all the points in the figure are an equal distance from a fixed point.

On the blank beside each shape in questions 24-29 write "Yes," if the shape shown is a polygon, write "No," if the shape is not a polygon.

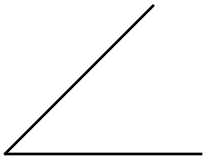
24. _____



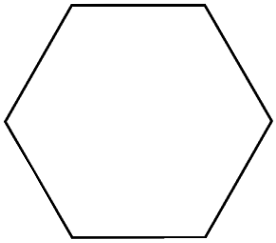
25. _____



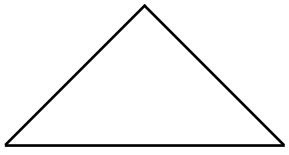
26. _____



27. _____

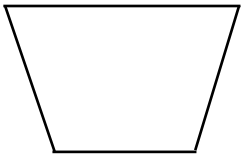


28. _____



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29. _____

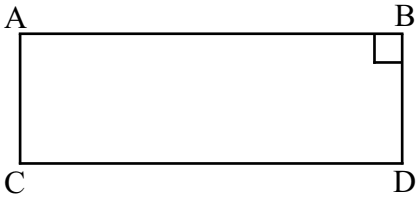


30. A ***trapezoid*** has _____ parallel sides and _____ non-parallel sides.

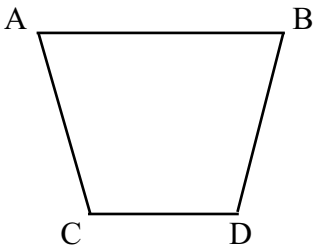
In 31-34, look at the figure beside each question and fill in the blanks with the correct response.

31. AB ∥ _____

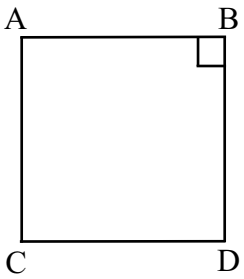
32. BD ∥ _____



33. _____ ∥ CD



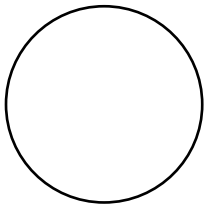
34. m∠ABD = _____



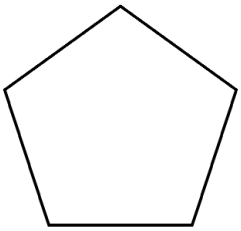
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Write the name of each shape on the blank beside it.

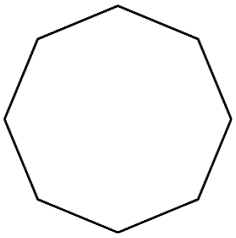
35. _____



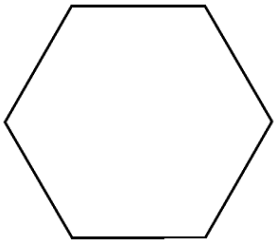
36. _____



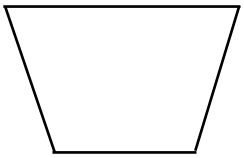
37. _____



38. _____



39. _____

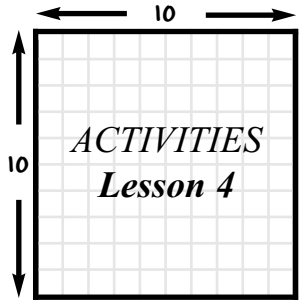


40. Write the **Life Principle**: "_____
_____."

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Name: _____

Date: _____ Grade: _____





Geometry

On the Perimeter

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 _____ of something is the distance around the outside of it.

2. Knowing the ***perimeter*** of objects or areas is important to _____.

3. Certain _____ apply for finding the perimeter of various shapes.

4. Math _____ exist for finding the perimeter of polygons and circles.

5. To find the perimeter of a polygon, you must _____ the length of all the sides.

6. In Example Set 1, the length of each side of the parallelogram shown is _____ units.

7. In Example Set 1, the perimeter of the parallelogram is _____ units.

8. The polygon in Example Set 2 has _____ sides.

9. The longest side in the polygon in Example Set 2 is _____ units long.

10. Symmetrical means that each half of the object is a(n) _____ of the other half.

11. In a symmetrical polygon the corresponding opposite sides are of _____ length.

12. In Example Set 2, the perimeter of the polygon is _____.

13. The formula for calculating the perimeter of a rectangle is _____.

14. If the sides of a rectangle are of equal length, *s*, then the formula for the perimeter would be $P = 4s$. _____ (a) True or (b) False

15. In Example Set 3, the answer was obtained by "plugging in" or _____ the dimensions of the polygon in the formula for the perimeter.

16. In Example Set 4, the area Aunt Polly wanted to fence in is in the shape of a _____.

17. 12 feet = _____ yards

18. Aunt Polly needs to purchase _____ yards of fence.

19. The perimeter of a circle is known as the _____ of the circle.

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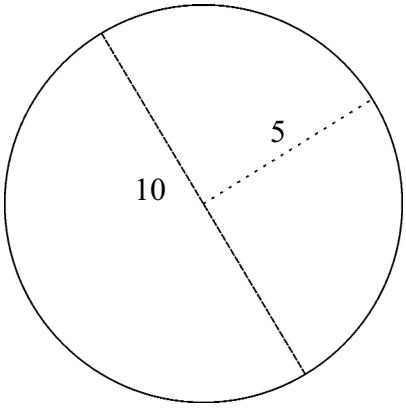
20. _____ a picture is a way to help you solve a math problem.

21. The _____ of a circle is the distance around the circle.

22. The distance from the center of the circle to a point on the circle is the _____.

23. The _____ is the length of the line that passes through the center of a circle with endpoints of the line on the circle.

24. In the circle below, the ***radius*** = _____, the ***diameter*** = _____.



25. The radius is one-half the diameter. _____ (a) True or (b) False
(Refer to #24 and Example Set 5)

26. The formula for computing the ***circumference*** of a circle when the radius is known is C = _____.

27. Another formula for computing the circumference of a circle when the diameter is known is C = _____.

28. In Example Set 5, since the diameter of the circle is twice the radius, the radius is _____ and the diameter is _____.

29. The value assigned to π in Example Set 5 is _____.

Work the following problems involving circumference in the space provided. Write the answers in the blank.

30. A horse trainer wanted to build a circular corral for training horses. The trainer wanted the corral to be 100 feet across. The length of the fence required to go around (circumference) the corral is _____ feet.

31. Consider the earth to have an approximate diameter of 8,000 miles. The circumference of the earth is _____.

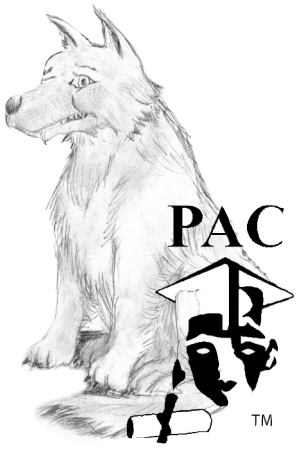
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32. The circumference of a circle of radius 4 inches is _____.

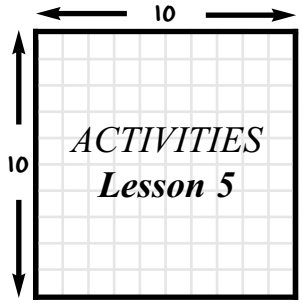
33. The circumference of a circle of radius 6 feet is _____.

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

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Geometry

Pythagoras

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 Greek named _____ was one of the most important men in the history of science and mathematics.

2. The _____ is the most well-known accomplishment of Pythagoras and his followers.

3. By using the Pythagorean ***Theorem***, you can find the _____ of the sides of a right triangle.

4. The _____ of a right triangle is the side opposite the 90° angle.

5. The ***hypotenuse*** is the _____ side of a right triangle.

6. The line segment, _____, is the hypotenuse of the triangle ABC, where ∠A is the right angle.

7. The Pythagorean Theorem states that in a right triangle the _____ of the length of the hypotenuse equals the sum of the _____ of the lengths of the other two sides.

8. _____ case letters are used to name triangles and each of their angles, while _____ case letters are used to represent the lengths of the sides in a triangle.

9. The Pythagorean Theorem written mathematically is _____= _____ + _____.

10. The symbol, $\sqrt{\ }$ means _____.

11. $\sqrt{16}$ = _____

Refer to Example Set 1 to answer questions 12-18.

12. The length of sides *a* and *b* is _____ unit.

13. The letter _____ represents the hypotenuse of the triangle.

14. The value of *a* and *b* are _____ or substituted into the formula for the Pythagorean Theorem.

15. Calculations are completed to obtain the equation c^2 = _____.

16. The operation of _____ is performed on both sides of the equation.

17. Whatever is done to one side of an equation, _____ be done to the other.

18. *c* = _____ units.

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19. The answer may remain in _____ to be considered proper.

20. Radical expressions contain a(n) _____ sign.

21. $(\sqrt{6})^2$ = _____

22. $(\sqrt{8})^2$ = _____

Refer to Example Set 2 to answer questions 23-26.

23. The length of the shortest side of the triangle shown is _____ unit/s.

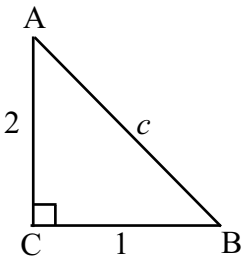
24. The length of the hypotenuse is _____ units.

25. After substitutions are made and calculations performed the equation for the length of the unknown side of the equation (Step 3) becomes ____ = a^2 + _____.

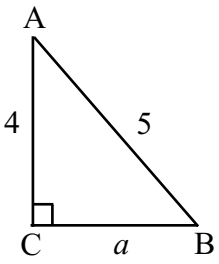
26. a^2 must be equal to _____ for 4 = a^2 + 3 to represent a true statement.

Use the Pythagorean Theorem to find the unknown lengths in the following triangles. Refer to Example Sets 1 and 2 to solve the problems.

27. c = _____

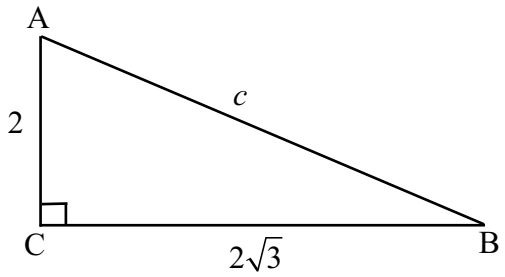


28. a = _____

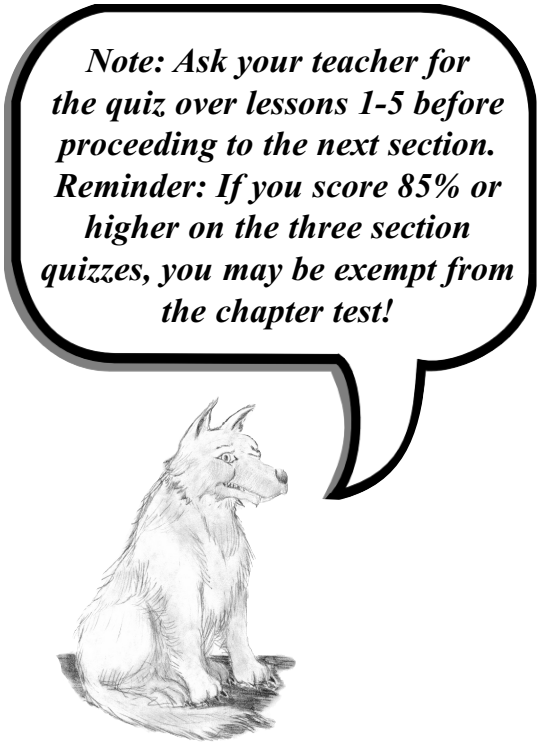


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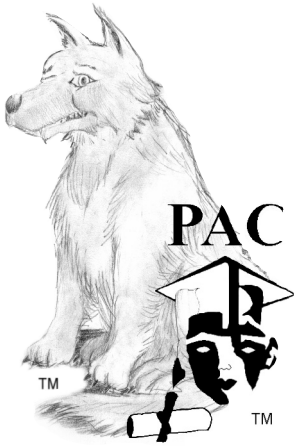
29. c = _____



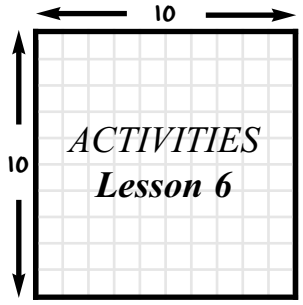
30. Write the **Life Principle**: "_____
_____."



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Geometry

Complements and Supplements

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. Angles whose measures add to 180° are _____ angles.

2. Angles whose measures add to 90° are _____ angles.

3. The symbol _____ means *the measure of an angle*.

4. Vertical angles are located on _____ sides of intersecting lines.

Determine if the following pairs of angles are complementary, supplementary or neither. Write the words "complementary," "supplementary" or "neither" on the blank beside each pair of angles.

5. m∠ABC = 90°; m∠DEF = 90° _____

6. m∠BCD = 75°; m∠DEF = 15° _____

7. m∠FGH = 60°; m∠ABC = 30° _____

8. m∠HIJ = 77°; m∠BCD = 23° _____

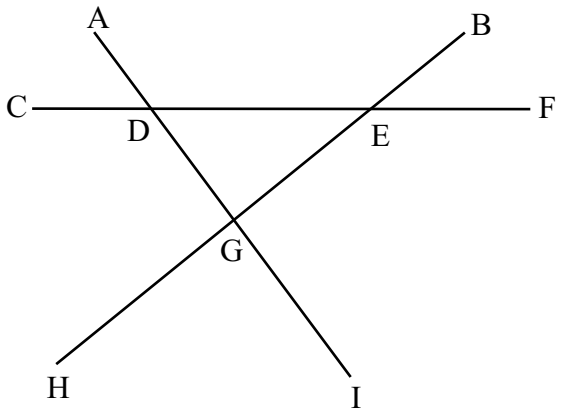
9. m∠EFG = 55°; m∠ABC = 35° _____

10. m∠FGH = 45°; m∠IJK = 45° _____

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Look at the figure below and answer questions 11-19.



True or False

11. ∠HGI and ∠DGE are vertical angles. _____

12. ∠FEH and ∠CEH are complementary. _____

13. ∠BEF and ∠BEC are supplementary. _____

14. m∠DGE + m∠IGE = 180°. _____

15. m∠BEF = m∠CEH. _____

16. m∠ADF + m∠ADC = 90°. _____

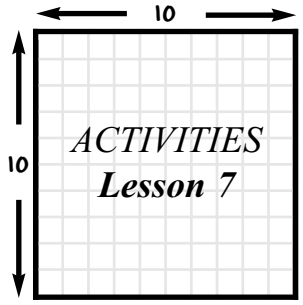
17. ∠AGH and ∠EGH are complementary. _____

18. ∠FDI and ∠ADC are vertical angles. _____

19. ∠FEH and ∠IGH are vertical angles _____

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

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Geometry

Transverse Angles

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 sum of the measures of ***interior angles of a transversal*** is _____.

2. Interior angles of a ***transversal*** are on the _____ side of the transversal.

3. When two parallel lines are cut by a transversal, _____ angles of a transversal are in the same position in relationship to the two parallel lines and the transversal.

4. Corresponding angles are _____.

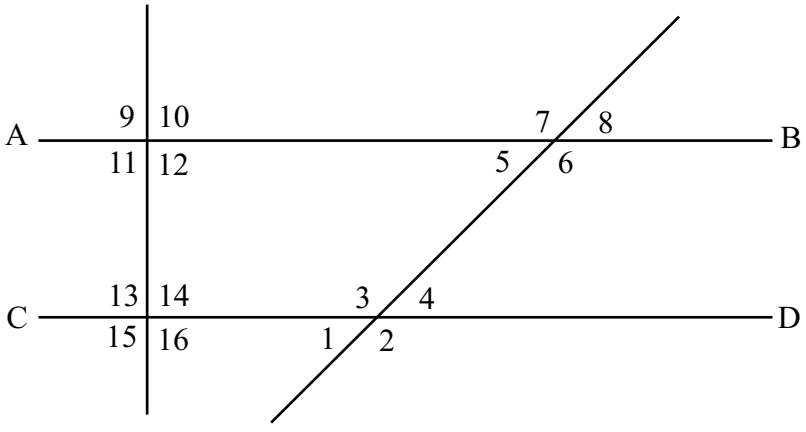
5. If the measures of two angles are equal, then the angles are _____.

6. _____ angles of a transversal are angles that are between two parallel lines cut by a transversal and on _____ sides of the transversal.

7. ***Alternate exterior angles*** are _____.

8. Angles above and below two parallel lines cut by a transversal and on opposite sides of the transversal are called _____ angles of a transversal.

Look at the figure below to answer questions 9-19. Refer to the definitions and Example Set 1 to help you answer the questions. Line AB is parallel to line CD.



9. m∠12 + m∠14 = _____.

10. ∠15 and ∠14 are _____ angles. (Remember Lesson 6)

11. ∠2 and ∠6 are _____ angles.

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12. ∠4 and ∠6 are _____ angles.

13. ∠9 and _____ are alternate exterior angles.

14. ∠3 _____ ∠7.

15. ∠4 _____ ∠8.

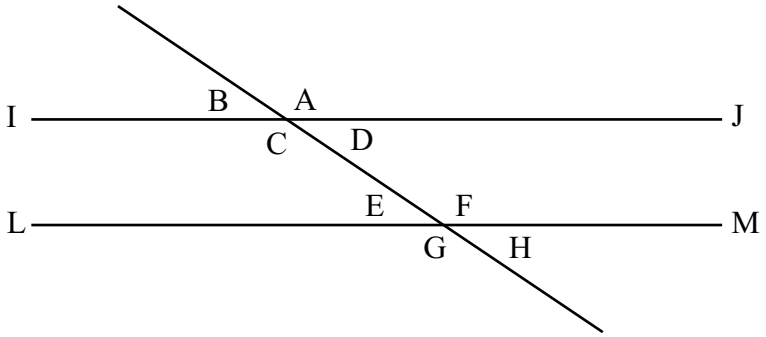
16. ∠1 and ∠3 are _____ angles because the sum of their measures is 180° or a straight line is formed when the two angles are placed adjacent to each other.

17. ∠8 and ∠1 are _____ because they are alternate exterior angles.

18. ∠5 and ∠4 are _____ angles.

19. ∠3 _____ ∠6.

Refer to Example Set 2 to answer questions 20-26 about the figure below. Line IJ is parallel to line LM.



Show that C and H are supplementary.

20. ∠H and ∠E are _____ angles.

21. ∠H _____ ∠E by definition of vertical angles.

22. m∠H _____ m∠E by definition of vertical angles.

23. ∠E and ∠C are _____ angles by definition of interior angles of a transversal.

24. m∠E + m∠C = _____ by definition of supplementary angles.

25. m∠H + m∠C = _____ by substitution from #22 into #24.

26. ∠H and ∠C are _____ angles because the sum of their measures is 180°.

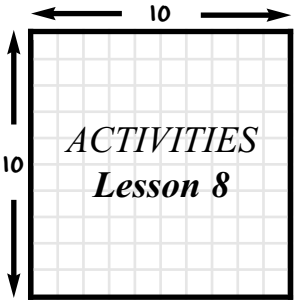
27. Write the **Life Principle**: "_____ _____."

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Geometry

Very Solid



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 a British colony.

2. Gibraltar is located on a(n) _____ in the Mediterranean Sea.

3. Whichever country controls the peninsula controls the passageway between the _____ and the _____.

4. _____ and _____ were built on the peninsula.

5. The _____ of _____ is a huge stone mountain.

6. "As solid as the Rock of Gibraltar" means _____ and _____.

7. A person's strength of character is sometimes compared to a _____.

8. A(n) _____ is geometric shape that has _____ dimensions and consists of all the points on the surface and in the interior.

9. A(n) _____ consists of exactly one interior, contains no holes, and is hollow.

10. A(n) _____ is an example of a ***simple closed surface***.

11. A bowling ball is another example of a simple closed surface. _____
(a) True or (b) False

12. A(n) _____ is the set of all points an equal distance from given point or center.

13. Examples of ***spheres*** include _____ and _____.

14. A flat surface is also known as a(n) _____.

15. A(n) _____ is the set of all points on the surface and all the interior points.

16. The side of a ***polyhedron*** is called a(n) _____.

17. A(n) _____ is a region in a plane that is in the shape of a polygon.

18. A simple closed surface consisting of ***faces*** is called a _____.

19. A(n) _____ is a polyhedron with two congruent (same) parallel faces in the shape of a polygon, connected by parallelograms.

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20. The polygon that forms the two parallel bases of a ***prism*** names the _____.

21. A(n) _____ is the end face of a polyhedron.

22. The face of a polyhedron that is not a ***base*** is called a(n) _____.

23. If the two parallel ***sides*** of a prism were hexagons, then the solid would be called a _____ prism.

24. A(n) _____ has six faces that are all squares.

25. A geometric figure with a circular base and tapers to a point is a(n) _____.

26. A geometric figure consisting of two parallel circular faces is a(n) _____.

27. A geometric figure with a polygon base and triangular faces that connect at one point is known as a(n) _____.

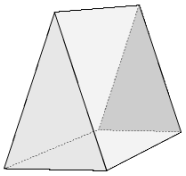
28. The number of faces on a polyhedron is obtained by _____ the number of bases and the number of sides.

29. A triangular prism has _____ faces.

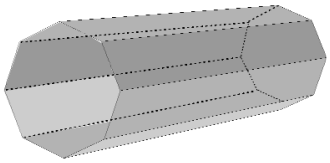
30. A pentagonal prism has _____ faces.

Using the information in this lesson, identify each polyhedron by filling in the name of each on the blank beside it.

31. _____

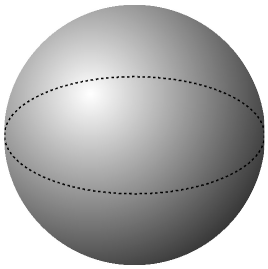


32. _____

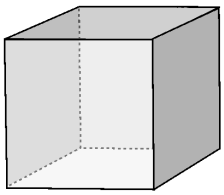


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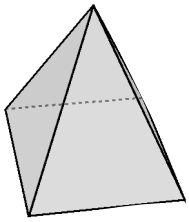
33. _____



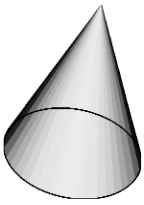
34. _____



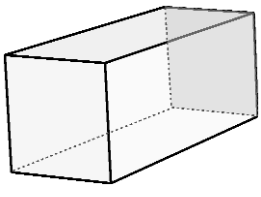
35. _____



36. _____

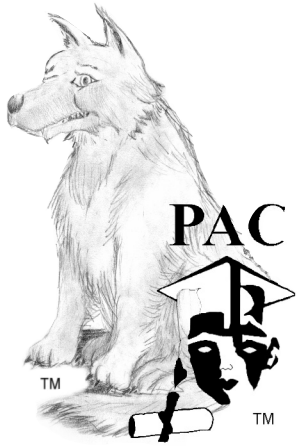


37. _____

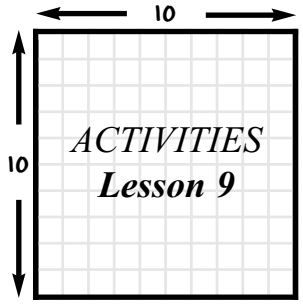


38. Write the **Life Principle:** "_____
_____."

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Geometry

Surface Area

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 total area of all the areas of the faces of a polyhedron is called the _____ _____ of a solid.

2. Companies often need to know the surface area of products to determine the amount of material that it will take to _____ the item.

3. _____ need to know the surface areas of rooms to know how much paint is needed to cover the walls and ceiling.

4. Determining the ***surface area of a solid*** involves finding the area of various polygons, then _____ these areas together.

5. To find the surface area of a rectangular prism requires calculating the area of each of _____ rectangles.

6. In Example Set 1, the dimensions of the rectangular prism are _____ high, _____ wide, _____ deep.

7. In Example Set 1, Step 1 is: _____ a picture.

8. The total surface area of the prism in Example Set 1 is _____ sq in.

9. Finding the surface area of triangular prisms is the same as with rectangular prisms. _____ (a) True or (b) False

10. In Example Set 2, Step 1 is: _____ a picture.

11. The formula for the area of a rectangle is _____ = _____.

12. The formula for the area of a triangle is _____ = _____.

13. _____ preliminary calculations must be done in Example Set 2, Step 3.

14. The surface area of the prism in Example Set 2 is _____ sq in.

15. The formula for calculating the area of a sphere is _____, where *r* is the radius of the sphere.

16. The value of π used in Example Set 3 is _____.

17. The radius of the sphere in Example Set 3 is _____ in.

18. The surface area of a sphere of radius 2 inches is _____.

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Find the surface areas of the following solids. Show you work in the space provided. Write your answers on the blanks.

19. A rectangular prism: 5 cm wide, 5 cm high, 5 cm deep _____

20. A triangular prism has a triangular base of sides 3 in., $2\frac{1}{2}$ in. and $2\frac{1}{2}$ in. The prism is 2 in. high and 6 in. long. _____

21. A square prism: 1 ft wide, 1 ft high, 6 ft long _____

22. A sphere: radius = 3 meters (Use $\frac{22}{7}$ for π) _____

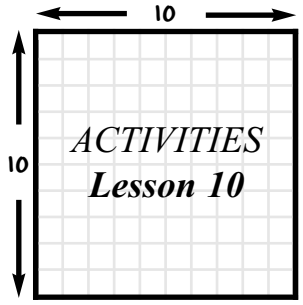
23. A sphere: radius = 7 in. (Use $\frac{22}{7}$ for π) _____

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

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Name: _____

Date: _____ Grade: _____



Geometry

More Surfaces

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. Companies must know the surface area of shapes other than _____ and _____.

2. Finding the surface area of a pyramid requires calculating the area of the _____ and the _____ of the pyramid.

3. The altitude or height of the face of a triangular pyramid is called the _____ _____.

4. In Example Set 1, Step 1 is to _____ a picture of the pyramid described.

5. In Example Set 1, the solid described is a(n) _____.

6. The number of preliminary area calculations required in Example Set 1 is _____.

7. The area of a side of the pyramid in Example Set 1 is _____.

8. The total surface of a square pyramid with a 4" × 4" base and height of 6" is _____ sq in.

Refer to Example Set 2 to answer questions 9-16.

9. The solid described here is a(n) _____.

10. Step 1 is to _____ a picture of the solid described.

11. The ***slant height*** of the triangular pyramid is _____.

12. A triangular pyramid has _____ faces.

13. The surface area of the triangular pyramid described is _____ sq in.

14. A _____ roll is an example of a cylindrical shape.

15. Each end of a cylinder is a(n) _____.

16. The three polygons used to form a cylinder are a(n) _____ and two _____.

Refer to Example Set 3 to answer questions 17-21.

17. The value of π used to calculate the area of the circular ends of the cylinder described is _____.

18. The area of one end of the cylinder is _____ sq in.

19. The length of the rectangle in Step 2 is obtained by calculating the _____ of one of the ends of the cylinder.

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20. The area of the rectangle is _____.

21. The surface area of the cylinder is _____ sq in.

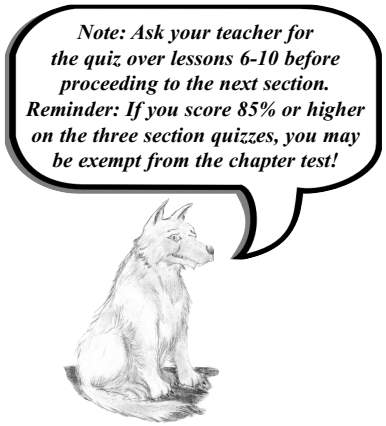
Find the surface areas of the following shapes. Show your work in the space provided.

22. In Egypt a pyramid measures 350 feet × 350 feet (base) and 240 feet slant height. The total surface area of this pyramid is _____ sq ft.

23. A soda can is 12 cm high and the diameter of the can is 6 cm. The amount of aluminum required to make the soda can is _____ sq cm. (Remember the radius of a circle is $^1/_2$ the diameter.) (Use $^{22}/_7$ for π)

24. A sculpture in the shape of a triangular pyramid was placed in front of a prominent office building. After a period of time the sculpture needed painting. You have been hired as the painter. You must calculate the surface area of the pyramid to order enough paint. The triangular base has an altitude of approximately 5.5 feet and a base of 9 feet. The other two sides of the triangle are also 9 feet. The slant height of the pyramid is 10 feet. The surface area of the pyramid is _____.

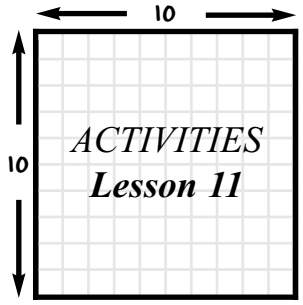
25. Write the **Life Principle:** "_____ _____."



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Name: _____

Date: _____ Grade: _____



Geometry

Volumes

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. Companies must calculate the volume of products to know how much _____ the product occupies.

2. How much a shape can hold is called _____.

3. _____ is how much space a solid occupies.

4. Volume is given in _____ units.

5. Trucking companies calculate the _____ of a trailer or cargo area of a truck to determine how much the trailers can haul.

6. Calculating the ***volume of a solid*** object requires the use of various _____.

7. The formula for calculating the volume of a rectangular prism is _____ = _____.

Refer to Example Set 1 to answer questions 8-10.

8. In Step 1, you are instructed to _____ a picture of the prism described.

9. In Step 2, you are to _____ the dimensions of the prism into the formula.

10. The volume of a rectangular prism 4" × 6" × 10" is _____ cubic inches.

11. The bases of a triangular prism are _____.

12. The formula for calculating the volume of a triangular prism is similar to the formula for calculating the area of a _____.

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

13. Step 1 instructs you to _____ a picture of the shape described.

14. The formula for the volume of a triangular prism is _____=_____.

15. In the formula for the volume of a triangular prism, *b* is the measure of the _____, *h* is the _____, and *l* is the _____.

16. The volume of the triangular prism is _____ cubic inches.

17. The formula for calculating the volume of a sphere is _____=_____.

18. In Example Set 3, the radius of the sphere is _____ inch.

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19. You must _____ the number, 1, into the formula for the volume of a sphere.

20. The volume of a sphere of radius 1 inch is _____ cubic inches.

Work the following problems. Show your work in the space provided and place the answer in the blank.

21. The Across the Country Moving Company (ACMC) received a contract to haul 20,000 cubic feet of goods from Chicago to Austin. The ACMC trailers are 8 feet tall, 8 feet wide and 40 feet long. _____ tractor-trailer rigs will be necessary for ACMC to transport the goods. (Hint: you must first calculate the capacity of a trailer and then divide that number into 20,000 cubic feet. Remember any partial trailer load will mean another whole trailer.) Think: A cargo trailer looks like a rectangular prism.

22. A chicken farm has a brood house that contains a watering system in the shape of a triangular prism for the chickens. The trough is 50 feet long, 4 inches across, and 2 inches deep. When full, the trough will hold _____ cubic feet of water. (Hint: you must change 4 inches and 2 inches into fractions of a foot.)

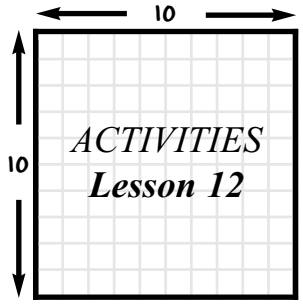
23. A petroleum storage tank at a refinery was in the shape of a sphere. This storage tank had a diameter of 30 feet. The storage tank would hold _____ cubic feet of petroleum. (Use 3.14 for π)

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

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Name: _____

Date: _____ Grade: _____



Geometry

More Volumes

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. Often companies need to calculate the volume of shapes other than _____ and _____.

2. The formula for calculating the volume of a pyramid is _____ = _____.

3. In the formula for the volume of a pyramid, the *h* represents the perpendicular ***altitude*** or _____, not the slant height.

Refer to Example Set 1 to answer questions 4-7.

4. Step 1 instructs you to _____ a picture of the solid described.

5. The dimensions of the pyramid are: *l* = _____, *w* = _____, *h* = _____.

6. Think! Notice that the formula for a pyramid is the formula of the volume of a rectangular prism multiplied by _____ (fraction).

7. The volume of the pyramid described in this example is _____ cubic inches.

8. The formula for calculating the volume of a cylinder is _____=_____.

9. The *r* in the formula for the volume of a cylinder represents the _____ of an end.

10. The *h* in the formula for the volume of a cylinder represents the _____ of the cylinder.

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

11. Step 1 instructs you to _____ a picture of the shape described.

12. Step 2 instructs you to place the values for height, *h* = ____ and *r* = ____ into the formula for the volume of a cylinder.

13. The volume of the cylinder is _____ cubic inches.

14. Think! Notice that the volume of a cylinder is the area of an end (circle), πr^2, multiplied times the _____ of the cylinder.

15. The formula for calculating the volume of a cone is _____ to that of a pyramid.

16. The formula for calculating the volume of a cone is also almost identical to the formula for the volume of a _____.

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17. The only difference between the volume formulas of the cone and cylinder is a factor of _____ (fraction).

18. If a cylinder and a cone have the same height and radius, then the cylinder would hold _____ cones full of water.

Refer to Example 3 to answer questions 19-22.

19. A cone is described as having a radius of ____ inch(es) and a height of ___ inch(es).

20. Step 1 instructs you to _____ a picture of the cone described.

21. The formula for calculating the volume of a cone is _____=_____.

22. The volume of the cone is _____ cubic inches.

Work the problems below. Show your work in the space provided and write the answer on the blank for each problem. Use $^{22}/_{7}$ for the value of π .

23. The volume of a pyramid of length 5 cm, height 6 cm and width 4 cm is _____.

24. The volume of a pyramid of length 200 feet, height 100 feet and width 200 feet is _____.

25. The volume of a cylinder 70 cm high and an end radius of 7 cm is _____.

26. Think! The volume of a cylindrical shaped tank is 600 gallons. The volume of a cone of the same height and radius is _____ gallons.

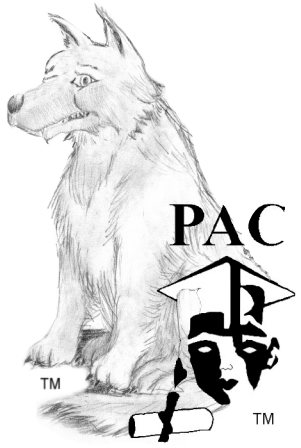
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27. Remember the soda pop can in a previous activity had a height of 12 cm and a diameter of 6 cm. The volume of the can is _____ cubic cm.

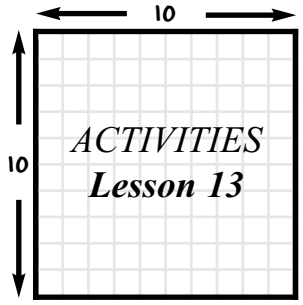
28. The volume of a cone of radius 8 inches and a height of 9 inches is _____ cubic inches.

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

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Algebra

Unknowns

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. Cooks follow a _____ to bake "new" items.

2. Ingredients in a recipe are the _____ quantities.

3. A formula is similar to a(n) _____.

4. In the formula for volume of a rectangular prism, $V = l \times h \times w$, the ***unknown*** is _____.

5. An unknown is usually denoted by a(n) _____ case letter.

6. To ***solve an equation*** means to _____ various operations on an equation.

7. The answer to an equation is the _____.

8. A(n) _____ is a group of related objects.

9. A ***solution set*** is the set of all the _____ to a problem.

10. _____ are the symbols used to denote a set.

11. The solution to the problem is placed _____ the set symbols to denote the solution set.

12. The unknown must be _____ on one side of the equal sign.

13. The value of an unknown can be obtained by following a series of _____ and _____.

14. In more simple terms, Rule 1 states that what you do to one side of an equation you must do the _____ to the other side of the equation.

15. If a 5 were added to one side of the equation, $x + 4 = 6$, then a(n) _____ must be added to the other side of the equation to maintain an equality.

In each of the questions 16-18, use Rule 1 to fill in the blank with the number that obtains an equality.

16. $x = 5$; $x +$ ____ $= 7$.

17. $12 = x$; $18 = x +$ _____.

18. $y = 24$; $y + 7 = 24 +$ _____.

19. To move a term to the other side of the equal sign, the _____ operation is performed.

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In questions 20-22, use Rule 2 to fill in the blank with each number that obtains an equality.

20. 7 - 7 = 0; 7 - 7 + ____ = 7.

21. $2x = 6$; $2x \div$ ____ = 3; $x = 3$.

22. $y + 6 = 18$; $y + 6 -$ _____ = 12.

23. When isolating the unknown, all _____ and subtractions are performed before multiplications and divisions.

In each of the questions (24-26), use Rule 3 to isolate the term indicated. Show your work in the space provided and write the final equation on the blank.

24. _____ 2(4) + 9 = 17; isolate the 4.

25. _____ 3 + 1 = 4: isolate the 1.

26. _____ $3x - 1 = 5$; isolate the x.

Refer to Example Set 1 to answer questions 27-31.

27. _____ is the unknown quantity in the problem.

28. If possible, _____ form is to isolate the unknown to the left hand side of the equation.

29. In Step 3, _____ is added to both sides of the equation.

30. In Step 5, the calculations are performed and the solution $x =$ ____ is obtained.

31. The solution is placed in _____ symbols to make a _____ set for the problem.

Refer to Example Set 2 to answer questions 32-35.

32. _____ divides the unknown.

33. The operation of _____ is performed on each side of the equation.

34. Both sides of the equation are multiplied by _____ to isolate the unknown.

35. After the operations are performed, the solution obtained is $x =$ _____.

36. Many problems require _____ operations to obtain the solution.

Refer to Example Set 3 to answer questions 37-40.

37. _____ and _____ are the two operations involved in solving this equation.

38. ___ is subtracted from both sides of the equation.

39. Both sides of the equation are divided by _____.

40. The solution is $x =$ _____.

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Solve the following equations for *x*. Place the solution within set symbols on the blank provided. Show your work in the space provided for each problem. (41-48)

41. $x + 1 = 9$ _____

42. $x - 7 = 8$ _____

43. $2x = 16$ _____

44. $4x = 44$ _____

45. $5x + 1 = 21$ _____

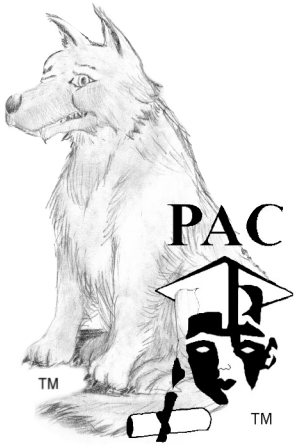
46. $7x - 4 = 45$ _____

47. $4 + 10x = 24$ _____

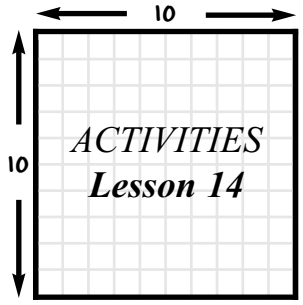
48. $9x - 3 = 60$ _____

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

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Algebra

Multiple Unknowns

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. Life is not always _____.

2. _____ factors affect us everyday.

3. Employment sometimes requires us to _____ big tasks by taking care of smaller tasks first.

4. Mathematics is a means by which we learn how to put small tasks in _____ to solve bigger tasks.

5. Many equations contain more than _____ unknown(s).

6. A formula common in mathematics is the _____ and _____ formula.

7. Write the distance formula mathematically. _____

8. In Example Set 1 a), after driving 2 hours at 55 mph, you would have traveled _____ miles.

9. In Example Set 1 b), the number of hours in 4 days is _____ hours.

10. The space ship in Example Set 1 b) traveled at a speed of _____ mph.

11. When solving equations with more than one unknown you must follow the same rules as if the unknowns were _____.

Refer to Example Set 2 to answer questions 12-18.

12. The equation $P = 2w + 2l$ is solved for _____.

13. The unknown, l, remains on the _____ of the equation.

14. Step 2 shows that the isolation process is started by subtracting _____ from each side of the equation.

15. After the subtraction of $2w$ is performed, the resulting equation is _____.

16. Both sides of the equation are then _____ by 2.

17. The fraction, $^{2l}/_{2}$ is _____ to l because $^{2}/_{2} = 1$, and $1 \bullet l = l$.

18. l =_____.

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19. Sometimes it is needful to solve formulas such as the formula for the volume of a triangular prism for a(n) _____ unknown or letter.

Refer to Example Set 3 to answer questions 20-24.

20. The formula is solved for the unknown _____.

21. The operations in this formula are all _____ except for division by 2.

22. Step 1 shows _____ both sides of the equation by the unknowns, *b* and *l*.

23. For ease of calculation the *h* _____ on the rhs of the equation.

24. When *h* is isolated, the resulting equation is *h* = _____.

Using what you have learned in this lesson, solve the following equations for the specified unknown. Show your work in the space provided and write the answer on the blank.

25. Solve, $P = 2w + 2l$ for w. w = _____

26. Solve, $V = \pi r^2 h$ for h. h = _____

27. A rectangular prism has a volume of 81 cubic cm, a length of 3 cm and a width of 3 cm. Find the value of *h* in the equation, $V = l \times w \times h$, by first solving for *h* and then substituting the values of *V*, *l* and *w* into the equation and performing the calculations. *h* = _____

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

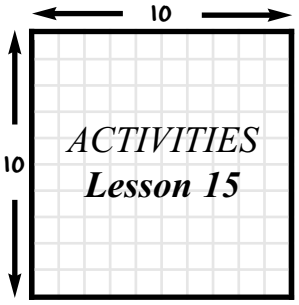
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Name: _____

Date: _____ Grade: _____



Algebra



Combining

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. _____ contain the same letters or unknowns.

2. Unless terms have exactly the same _____, they are not considered ***like terms***.

3. Combining like terms can be compared to the _____ and _____ section of a grocery store.

4. Fruits and vegetables are separated according to the _____ of produce.

5. Apples and oranges are usually combined into the same bin. _____
(a) True or (b) False

6. Oranges and tangerines look similar, but they are _____.

7. _____ terms do not contain the same letter or unknown.

8. x and x^2 are _____ terms.

Refer to Example 1 to answer questions 9-14. Write "like" on the blank if the terms are like, or "unlike" on the blank if the terms are unlike.

9. x^4, x^5 _____

10. $2y$, $4y$, 49 _____

11. 10, 20, 30, 40 _____

12. $3x$, $7x$ _____

13. $4x^2$, $4x$ _____

14. $23x$, $5x$, $6x$ _____

15. Terms can be _____ by following simple rules.

16. In an equation containing more than one term, only _____ terms can be added or subtracted before solving for the unknown.

Refer to Example 2 to answer questions 17-24.

17. _____ is the unknown quantity in the equation $2x - 5 = 6 - 9x$.

18. "x" must be _____ on one side of the equals sign.

19. _____ terms must be combined.

20. In Step 3, 5 is _____ to both sides of the equation.

21. The equation resulting from adding 5 to both sides of the equation is _____.

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22. Adding $9x$ to both sides of the equation isolates all the unknowns on the _____ of the equation.

23. Combining like terms, yields the equation _____.

24. Solving $11x = 11$ for x, yields a solution of $x =$ _____.

25. Only _____ terms may be combined.

Solve the following equations for *x*. Show your work and write the solution on the blank. Refer to Example Set 1 and 2 as needed.

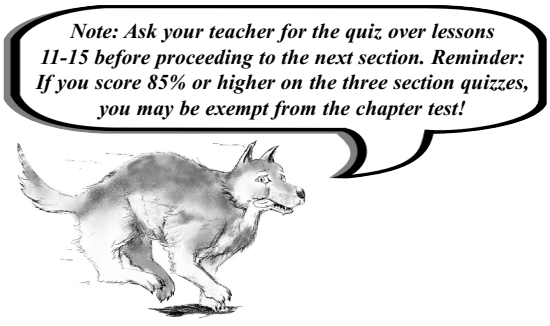
26. $4x + 5 = 2x + 13$ _____

27. $3x - 4 = 2x + 2$ _____

28. $20 - 4x = 30 - 9x$ _____

29. $15x + 45 = 5x + 65$ _____

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



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Basic 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

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

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

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

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

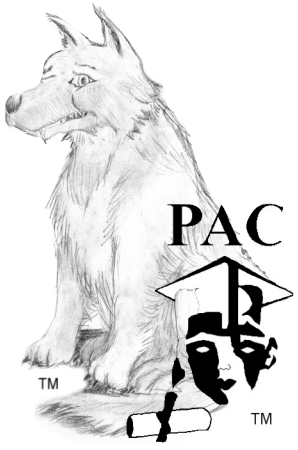
Metric to English	
1 centimeter	0.3937 in.
1 meter	39.37 in.
1 meter	1.09 yds
1 kilometer	0.6213 mile

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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