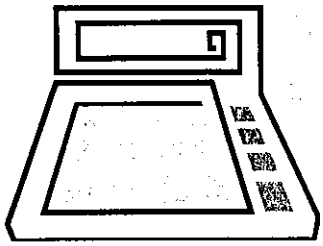
Name: _____ Hour: _____

# 8th Grade Math

# Weekly Skills Assessment #10



Directions: Complete all problems in this packet to prepare for **EXPLORE.** You MUST show all work on each problem in order to earn credit. All answers should be written in simplest form.

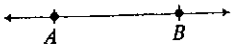
This packet counts as ¼ of a summative assessment for quarter 3.

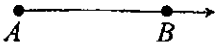
It is due on: **Friday, March 6** *(incomplete or missing packets will be ZAPPED)*

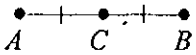
* Remember that you have 1 week to complete the packet. If you need help, please see Mr. Kueppers or Mrs. Zaborowski for assistance, but do not wait until the last minute (Thursday afternoon or Friday morning) to do so.

This week, your skills assessment will focus on reviewing the major **Geometry** concepts you will need to know for EXPLORE. Use the short explanations of each of these concepts below to answer the questions that follow.

Topic #1: ***Basic Geometry Terminology***

- A line is a set of infinite points that runs straight. 

- A ray is a line that has one endpoint. It extends infinitely in the direction without the endpoint. 

- The midpoint is the point exactly halfway between the two endpoints of a line segment. 

- To bisect means to cut exactly in half.

Topic #2: ***Triangles***

- The Triangle Inequality Theorem states that the sum of the measures of any two sides of a triangle is always greater than the measure of the third side.

  For example:

  Suppose the three sides of a figure are 5, 8, and 16. Is this a triangle?

  $5 + 8 > 16$ FALSE

  $8 + 16 > 5$ TRUE

  $5 + 16 > 8$ TRUE

  No, this is NOT a triangle.

- The sum of the measures of the interior angles of a triangle is always 180°.

- In any triangle, the angles opposite congruent sides are congruent, and the sides opposite congruent angles are congruent. The largest angle is always opposite the longest side, and the smallest angle is always opposite the shortest side.

Topic #3: ***Area and Perimeter Formulas***

- The perimeter of any figure is found by summing all of the side lengths.
  - For a triangle, $P = a + b + c$
  - For a rectangle, $P = 2l + 2w$
  - For a parallelogram, $P = 2a + 2b$ (where a and b are the lengths of the two sides)
  - For a trapezoid, $P = a + b_1 + c + b_2$

- The area of a triangle is: $A = \frac{1}{2} * b * h$ (where b=base and h=height)

- The area of a rectangle is: $A = b * h$ OR $A = l * w$

- The area of a square is: $A = s^2$

- The area of a parallelogram is: $A = b * h$

- The area of a trapezoid is: $A = \frac{1}{2} h(b_1 + b_2)$ (where $b_1$ and $b_2$ are the bases of the trapezoid)

Topic #4: ***Circles***

- The circumference of a circle is: $C = 2\pi r$

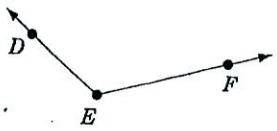
- The area of a circle is: $A = \pi r^2$

Topic #5: ***Three-Dimensional Figures***

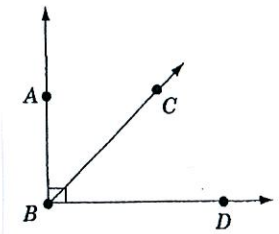
- The volume of a rectangular solid is: V = l * w * h
- The surface area is a rectangular solid is the sum of all the areas of the rectangles forming the solid.

Topic #6: ***Angles and Angle Relationships***

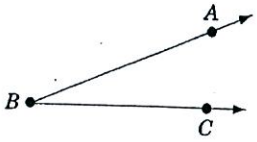
- An angle is a geometric figure consisting of two rays with a common endpoint. The common endpoint of the rays is called the vertex of the angle.
- There are many different types of angles, all categorized by the number of degrees they have.
  - Acute angle – an angle measuring less than 90°
  - Obtuse angle – an angle measuring greater than 90° but less than 180°
  - Right angle – an angle measuring exactly 90°
  - Complementary angles – two angles whose sums equal 90°
  - Supplementary angles – two angles whose sums equal 180°
  - Vertical angles – the angles that lie opposite each other when two lines intersect (vertical angles are always equal)



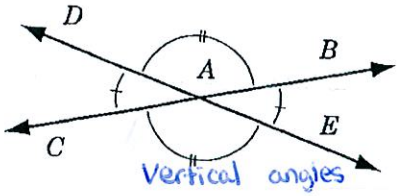
obtuse angle



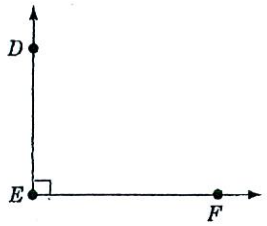
complementary angles

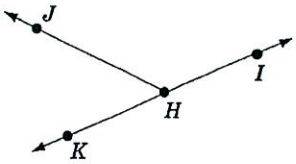


acute angle

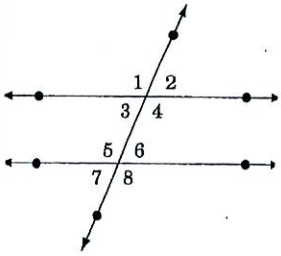


Vertical angles



supplementary angles




Occasionally, you will run into a question in which two parallel lines are cut by a third straight line, called a transversal. The eight angles formed by these two intersections have special relationships with one another:

- Angles 1 & 5 and 3 & 7 and 2 & 6 and 4 & 8 are called corresponding angles. They are equal to each other.
- Angles 1 & 8 and 2 & 7 are called alternate exterior angles. They are equal to each other.
- Angles 3 & 6 and 4 & 5 are called alternate interior angles. They are equal to each other.
- Angles 3 & 5 and 4 & 6 are called same-side interior angles. They are supplementary.

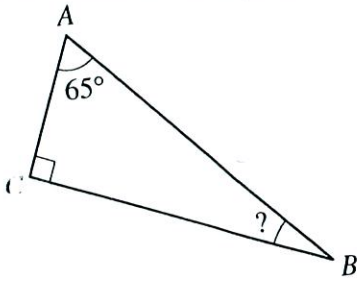
Practice Problems (1 point each and you MUST show your work):

1. One side of a triangle is 8 feet long and another side if 16 feet long. Which of the following CANNOT be the length of the third side? **EXPLAIN WHY.**
   a. 4
   b. 9
   c. 12
   d. 16
   e. 20

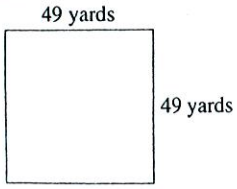
2. One of the groups of 3 numbers listed below CANNOT represent the lengths of the sides of a triangle. Which group is it? **EXPLAIN YOUR ANSWER.**
   a. 10, 9, 8
   b. 10, 8, 7
   c. 10, 7, 6
   d. 10, 6, 5
   e. 10, 5, 4

3. The two sides of a triangle are each 5 meters long. Which of the following CANNOT be the length of the third side, in meters? **EXPLAIN YOUR ANSWER.**
   A. 3
   B. 6.5
   C. 8
   D. 9
   E. 10

4. In the triangle below, if angle A measures 65° and angle C measures 90°, what is the measure of angle B?

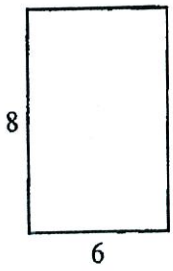



5. What is the perimeter, in yards, of the square shown below?

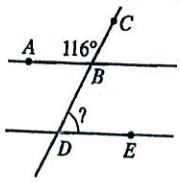



6. In the triangle shown below, what is the value of x?


7. Janae is trimming a photo so it will exactly fit behind the glass rectangle shown below, which measures 6 inches wide and 8 inches tall. She will decorate the perimeter of the glass rectangle with edging. What is the perimeter, in inches, of the glass rectangle?

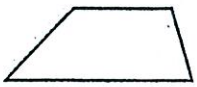



8. In the figure below, line $\overleftrightarrow{AB}$ is parallel to line $\overleftrightarrow{DE}$, and B is on line $\overleftrightarrow{CD}$. The measure of angle ABC is 116°. What is the measure of angle BDE?

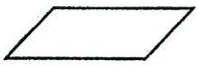



9. Each of the following quadrilaterals is a parallelogram except for one. Circle the one that is NOT a parallelogram.

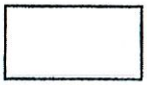
**A.**



**B.**

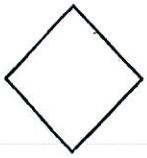


**C.**

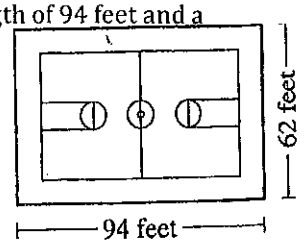


**D.**

**E.**



10. McDuff Middle School is refinishing the gym floor shown below. The school needs to know the area of the floor in order to know how much floor coating to purchase. The gym floor is rectangular with a length of 94 feet and a width of 62 feet. What is the area, in square feet, of the gym floor?

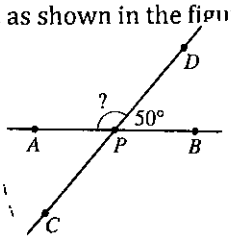



11. A circular fountain has a radius of 4 feet and is surrounded by a 1-foot wide border. To the nearest tenth of a square foot, what is the area of the border?

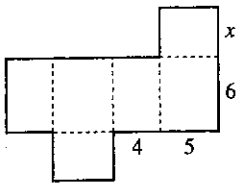
12. The formula for the surface area of a sphere with a radius of r is $A = 4\pi r^2$. To the nearest tenth of a square foot, what is the surface area of a sphere with a *diameter* of 2 feet?

13. The sum of the measures of the 3 angles in a triangle is 180°. If the measure of one angle in a triangle is 40°, which of the following could NOT be the measure of another angle in the triangle? **EXPLAIN WHY.**
    A. 1
    B. 40
    C. 90
    D. 99 ½
    E. 141

14. Lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at P, as shown in the figure below. Given that the measure of angle DPB is 50°, what is the measure of angle DPA?




15. The figure below is a net (flat pattern) of a geometrical solid. The net, when folded on the dashed lines, makes a right rectangular prism. The given lengths are in feet. What is x?




16. A right triangle has legs that are 7 meters long and 12 meters long, respectively. What is the area, in square meters, of the triangle?

17. A circular pizza has a circumference of 33 inches. What is the area of the pizza?

18. George is building a birdhouse. He wants the circular opening to have a diameter of 1 ½ inches. He needs to know the radius of the hole so he can draw it on the board with his compass. What is the hole's radius, in inches?

19. When the shape in the figure below is reflected across the dashed line, the shape and its reflection combined resemble a capital letter H. Which of the following shapes combined with its reflection across the dashed line would resemble another capital letter?

**A.** 

**B.** 

**C.** 

**D.** 

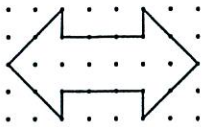
**E.** 

20. A deck and flower garden will be put into an 8-yard by 3-yard rectangular area in the backyard. If the area of the deck will be 18 square yards, what will the area of the flower garden be, in square yards, if it takes up all of the remaining rectangular area?

21. Pia's aquarium is shaped like a rectangular prism. The inside of her aquarium is 40 cm long and 20 cm wide. If the aquarium is filled with water to a depth of 15 cm, how many liters of water are in the aquarium. (Note that 1 liter = 1,000 cubic cm)

22. What is the area, in square yards, of a rectangular field that is 25 yards long and 20 yards wide?

23. The figure shown below is drawn so that each vertex is a dot on a uniform grid. How many lines of symmetry does the figure have?



24. Begin with a circle with center O and diameter AOB and pick any two points on the circle different from A and B. Call one point X and the other Y. Then draw XY. Of the following statements about AB and XY, which, if any, is *always* true?
    a. $\overline{AB}$ will intersect $\overline{XY}$
    b. $\overline{AB}$ will be shorter than $\overline{XY}$
    c. $\overline{AB}$ will be longer than $\overline{XY}$
    d. $\overline{AB}$ will be the same length as $\overline{XY}$

25. What are the measures of the two angles shown in the figure below?