First name: _____ Last name: _____                    Student ID: _____

# Geometry Homework

## Basic problems

**1. Find the volume of each solid. Leave your answer in exact value. Show work!**

| | |
|---|---|
| 1. cylinder: r = 4 yd, h = 22 yd | 2. pyramid: B = 34 km$^2$, h = 11 km |
| 3. pyramid: B = 15 ft$^2$, h = 17 ft | 4. rectangular prism: l = 13 m, w = 6 m, h = 19.7 m |
| 5. triangular prism: B = 39 in$^2$, h = 2 in | 6. sphere: r = 8 cm |

**2. Find the area. Show work!**

| | |
|---|---|
| 1. Find the area of the triangle whose vertices are (3, 5), (0, 5), and (3, -4) | 2. Find the area of the rectangle whose vertices are (7, 2), (7, -1), (2, 2), and (2, -1) |
| 3. Find the area of the parallelogram whose vertices are (-5, 1), (-2, 1), (0, -3), and (-3, -3) | 4. Find the area of the trapezoid whose vertices are (4, 0), (-4, 4), (0, 0), and (4, 4) |

**Challenge problems**

1. A quadrilateral is shown on the graph below. Suppose that a new quadrilateral A′B′C′D′ were defined by multiplying each component of the coordinates of ABCD by –2. (For example, the coordinates of A′ would be (6, 2).) Which statement would be true?

a. The area of A′B′C′D′ would be 4 times that of ABCD.
b. The area of A′B′C′D′ would be -4 times that of ABCD.
c. The area of A′B′C′D′ would be 2 times that of ABCD.
d. The area of A′B′C′D′ would be -2 times that of ABCD.
e. The area of ABCD would equal to that of A′B′C′D′.
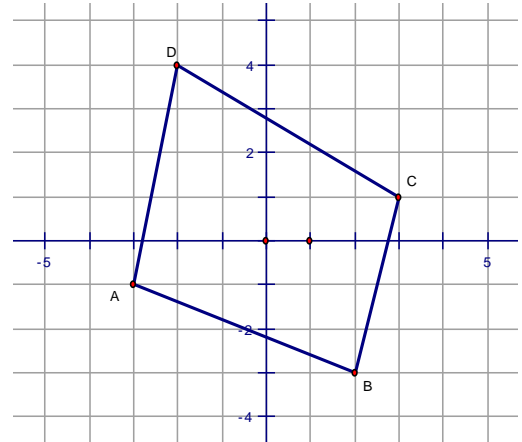
2. A support wire is attached at a point one third of the way down from the top of a vertical pole. If the wire is 15 feet long and is attached to the level ground at a point that is 12 feet from the base of the pole, how tall is the pole?

3. On the graph shown, parallelogram BCDE has been rotated 90° counterclockwise to produce its image, parallelogram B'C'D'E'. What point is the center of the rotation?
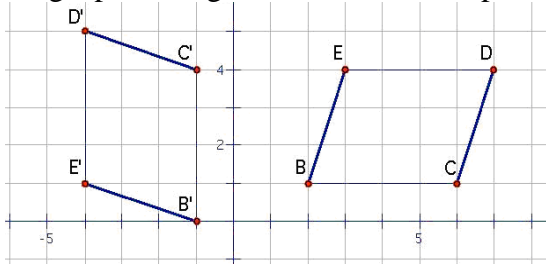


4. Which of the following figures is IMPOSSIBLE?
    a. A parallelogram in which any two adjacent angles have a sum of 180°
    b. A rhombus that is a rectangle          c. A scalene right triangle
    d. A trapezoid with two congruent sides       e. An obtuse right triangle

5. Which of the following statements is false?
    a. Any two circles are similar figures.       b. Any two squares are similar figures.
    c. Any two rectangles are similar figures.    d. Any two spheres are similar solids.
    e. Any two cubes are similar solids.

6. There are 150 rectangular tiles that are 2 inches by 3 inches. They are all used to cover a square region with no gaps or overlaps between the tiles. No tiles are cut or broken in the process. What is the perimeter of the square that is covered?

7. The solid shown below has a volume of 6 cubic inches (as indicated).  What is its surface area?



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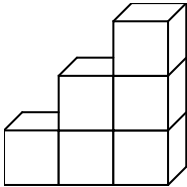
8. A quadrilateral has diagonals that bisect each other.  Which statement MUST be true about this quadrilateral?

   a.  The diagonals must be congruent to each other.
   b.  The diagonals must be perpendicular to each other.
   c.  The quadrilateral has exactly one pair of parallel sides.
   d.  The quadrilateral has four congruent angles.
   e.  Both pairs of opposite angles of the quadrilateral are congruent.

9. The net of a cone is composed of a circle (the base) and the sector of a circle whose radius is greater than that of the base.  The sector forms the lateral surface of the cone.  Below is a sector that could be the lateral surface of a cone.  To assemble the cone, the two straight edges of the sector come together; the curved edge of the lateral surface must match the edge of the base.  If the 270˚ sector with radius of 6 cm forms the lateral surface of a cone, what is the radius of the base of that cone?
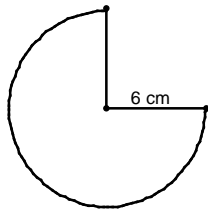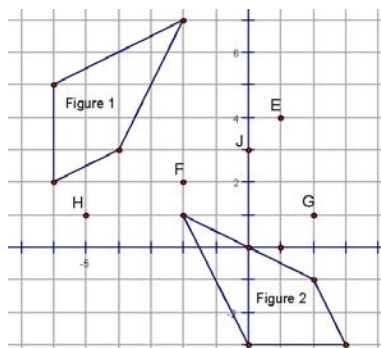


10. Quadrilateral ABCE is a parallelogram.  The measure of ∠EDC is 58˚, ∠BAD = 88º, ∠AED = 22º.What is the measure of angle ABC?
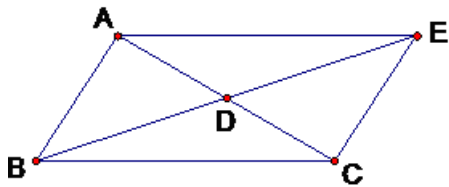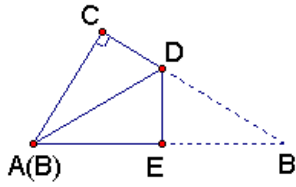


11. Figure 2 is the image produced when Figure 1 is rotated 90°.  Which of the given points is the center of the rotation?

   a. Point E     b. Point F     c. Point G     d. Point H     e. Point J



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12. In a right triangle ABC, two legs with AC = 6, BC = 8. Fold $\triangle$ABC to let vertices A and B be together. If the fold line is DE, determine CD.



13. Opposite sides of a regular hexagon are 12 inches apart. What is the length of each side, in inches?