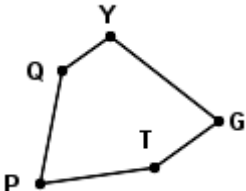



First name: _____ Last name: _____ Student ID: _____

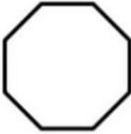


Geometry Homework

Basic problems

1. Find the perimeter of each figure.

1.	Polygon PQYGT:	2.	Polygon QCV:
	$\overline{PQ} = 114 \text{ mm}$ $\overline{QY} = 58 \text{ mm}$ $\overline{YG} = 136 \text{ mm}$ $\overline{GT} = 78 \text{ mm}$ $\overline{TP} = 116 \text{ mm}$		$\overline{QC} = 24 \text{ mm}$ $\overline{CV} = 15 \text{ mm}$ $\overline{VQ} = 36 \text{ mm}$

2. Find the *order* and *angle* of rotational symmetry, as well as the number of lines of symmetry.

		
A regular heptagon (7-gon)	An isosceles trapezoid	The letter S

Challenge Problems

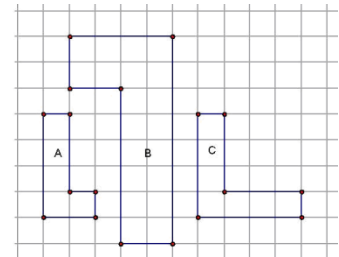
1. A large cube is made up of identical unit cubes. After the unit cubes are glued together to form the large cube, it is dipped in paint. For example, 27 unit cubes could be assembled into a $3 \times 3 \times 3$ cube. After it was dipped in paint, 8 of the unit cubes would have three painted faces, 12 would have two painted faces, 6 would have one painted face, and 1 would have no painted faces. If 1,728 unit cubes were assembled into a $12 \times 12 \times 12$ cube and then dipped into paint, how many of the unit cubes would then have a) 3 painted faces?
b) 0 painted faces?

2. In *scalene* triangle ABC the measure of angle A is 60° . Which statement CANNOT be true about *scalene* triangle ABC?

- A. Triangle ABC is an equilateral triangle.
- B. Triangle ABC is an obtuse triangle.
- C. Triangle ABC is an acute triangle.
- D. The measure of angle C is greater than the measure of angle A.
- E. The measure of angle B is less than the measure of angle A.

3. Which statement is true for the figures shown on the right?

- A. Figure A is mathematically similar to Figure B, but not to Figure C.
- B. Figure A is mathematically similar to Figure C, but not to Figure B.
- C. Figure B is mathematically similar to Figure C, but not to Figure A.
- D. All three figures are mathematically similar to each other.
- E. Figure A is not mathematically similar to Figure B or to Figure C.



Note: Two shapes are similar if they have the same shape, but not the same size.

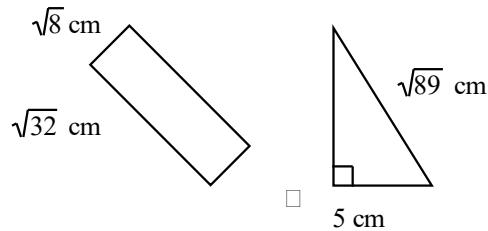
4. Jan wanted to make a cylinder 8 centimeters tall whose bases were 10 centimeters in diameter. She decided to cut out 2 circles for the bases and a rectangle to make the lateral surface of the cylinder. There would be no gaps or overlaps and she would use tape to connect all the edges. What should be the dimensions (to the nearest millimeter) of the rectangle?

- A. 8 mm by 20 mm
- B. 80 mm by 200 mm
- C. 80 mm by 3142 mm
- D. 80 mm by 314 mm
- E. 80 mm by 31 mm

5. Which statement could be false?

- A. A rectangle whose side lengths are 4 cm and 5 cm is similar to a rectangle whose side lengths are 1 cm and 1.25 cm.
- B. A parallelogram whose side lengths are 6 cm and 12 cm is similar to a parallelogram whose side lengths are 18 cm and 36 cm.
- C. All squares are similar to each other.
- D. A triangle whose sides are 3 cm, 4 cm, and 5 cm is similar to a triangle whose sides are 15 cm, 20 cm, and 25 cm.
- E. All triangles with angles of 35° and 44° are similar.

6. Which statement is true concerning the rectangle and the right triangle whose side lengths are as shown here?



- A. The perimeter of the rectangle is greater than the perimeter of the triangle.
- B. It is impossible to determine whether the perimeter of the rectangle is greater than the perimeter of the triangle.
- C. The area of the triangle is greater than the area of the rectangle.
- D. The area of the rectangle is equal to the area of the triangle.
- E. The area of at least one of the figures is *irrational*.

Note: Irrational numbers are a type of number that you can't write down exactly as a simple fraction where both the numerator and the denominator are integers. They have decimal points that go on forever without repeating in a pattern.

7. Which of the following figures CAN be made?

- A. An equilateral right triangle.
- B. A trapezoid that has exactly one right angle.
- C. An obtuse triangle with exactly one acute angle.
- D. A regular pentagon with each interior angle having a measure of 72° .
- E. A parallelogram with diagonals that are perpendicular to each other.

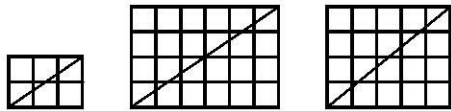
8. A crepe paper streamer is 823.5 centimeters long. To decorate a table, the streamer is cut into strips that are 45 cm long. After as many 45-cm strips as possible have been cut from the streamer, how long will the leftover piece of streamer be?

- A. 3 cm long B. 0.3 cm long C. 0.03 cm long D. 13.5 cm long E. 1.35 cm long

9. A rhombus has sides that are each 12 decimeters in length. Which statement is true about this rhombus?
- A. The area of the rhombus is at least 144 square decimeters.
 - B. The area of the rhombus is 144 square decimeters.
 - C. The area of the rhombus is at most 144 square decimeters.
 - D. The area of the rhombus is less than 144 square decimeters.
 - E. The area of the rhombus is 48 square decimeters.

10. Which of the following figures always has *exactly* two lines of symmetry?
- A. A square
 - B. A non-square rhombus
 - C. An isosceles trapezoid that has exactly one pair of parallel sides
 - D. A kite that is not a rhombus
 - E. A non-rectangular parallelogram

11. Rectangles are made of small congruent squares. A diagonal drawn from the bottom left to the top right of a rectangle cuts through the interior of some of the squares. (Count only squares for which the diagonal goes through the interior of the square—not just the vertex.) For a 2×3 , the diagonal goes through 4 squares. For a 4×6 it goes through 8. For a 4×5 it goes through 8. How many squares would a diagonal of a 28×35 rectangle go through?



12. Find the area of the shaded region.

