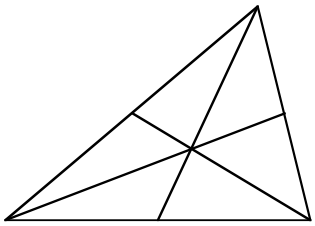
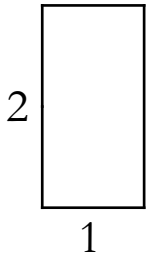
# Whatcom County Math Championship – 2012
# Geometry – 4th Grade

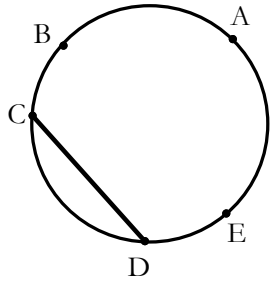
1. How many triangles of all sizes are there in the picture below?



2. William has 8 of the tiles shown below, and he arranges them into the longest rectangle possible. What is the perimeter of that rectangle?




3. A line segment (such as $\overline{CD}$ as shown) that connects any two points of a circle is called a chord of the circle. How many different chords, including $\overline{CD}$, can be drawn using only points A, B, C, D and E (Note: $\overline{CD}$ is the same as $\overline{DC}$).




4. Annie arranged pennies on a table in the figures below; how many pennies would there be in the next figure if the she arranges pennies all the way around?

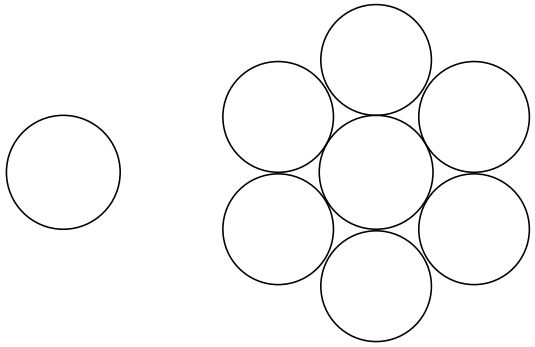
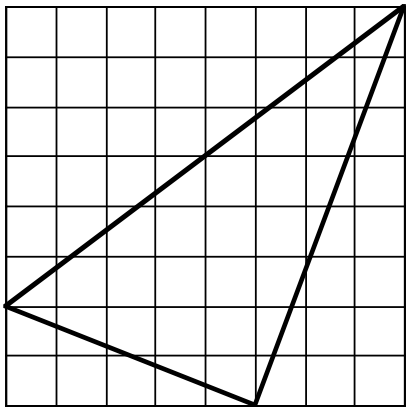


figure 1 figure 2

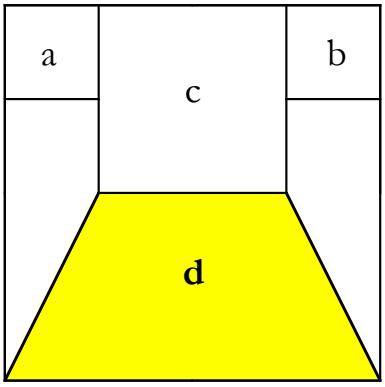
5. How many **total** lines of reflectional symmetry are there in the symbols below?

6. Each side of a square is 6 inches long. A rectangle that has the same area as the square has a width of 4 inches. What is the perimeter of the rectangle in inches?

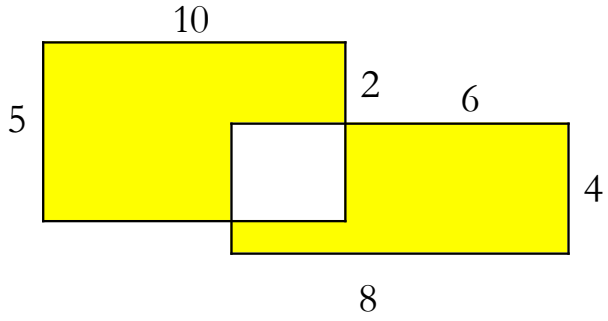
7. Find the area of this triangle, if each small square is one unit.



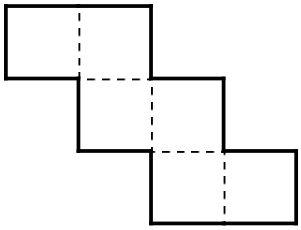
8. In the large square below, the areas marked **a** and **b** are each 4, and the area of **c** is 16. What is the area of the trapezoid marked **d**?




9. Find the area of the shaded region below:




10. Below is the net of a cube (if you folded it on the dotted lines, you would get a cube). The surface area of the net is 150 square units. What is the volume of the cube?



# Whatcom County Math Championship – 2012
# Geometry – 5th Grade

1. Annie arranged pennies on a table in the figures below; how many pennies would there be in the next figure if the she arranges pennies all the way around?

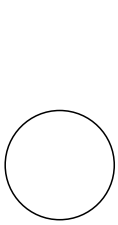


figure 1

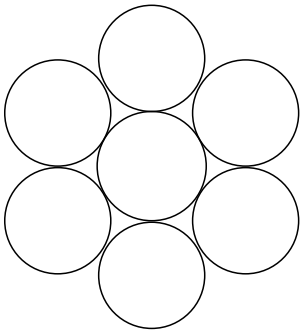
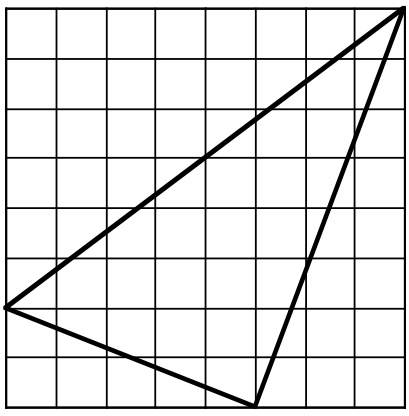


figure 2

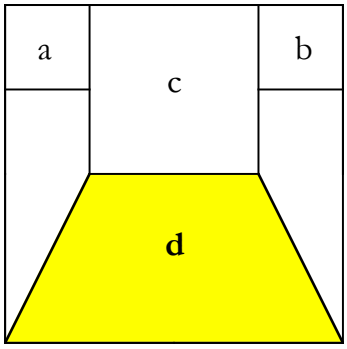
2. How many **total** lines of reflectional symmetry are there in the symbols below?

3. Each side of a square is 6 inches long. A rectangle that has the same area as the square has a width of 4 inches. What is the perimeter of the rectangle in inches?

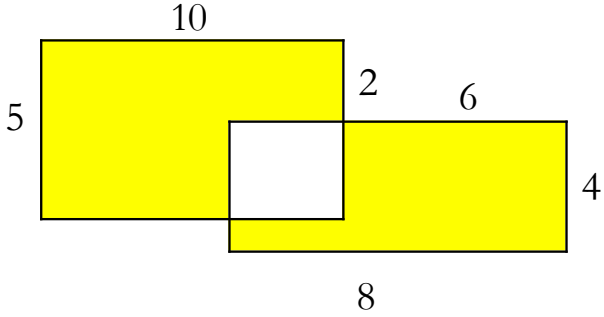
4. Find the area of this triangle, if each small square is one unit.



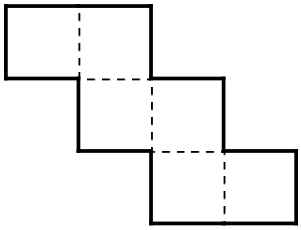
5. In the large square below, the areas marked **a** and **b** are each 4, and the area of **c** is 16. What is the area of the trapezoid marked **d**?



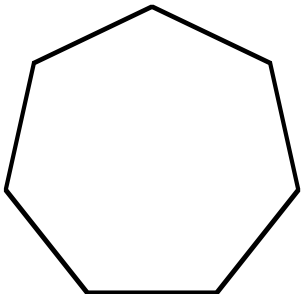

6. Find the area of the shaded region below:



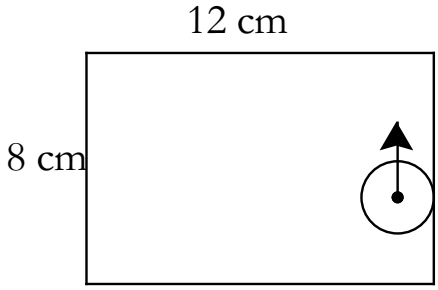

7. Below is the net of a cube (if you folded it on the dotted lines, you would get a cube). The surface area of the net is 150 square units. What is the volume of the cube?



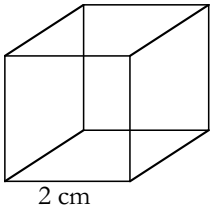
8. How many diagonals are there in this heptagon?



9. A circle with radius 1 cm is inside a rectangle that is 8 cm by 12 cm. The circle rolls once around the rectangle without slipping, always touching at least one side until it returns to its starting point. Find the distance traveled by the center of the circle, in centimeters.

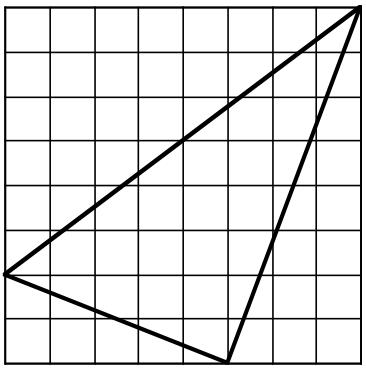



10. The cube below is painted with red paint. If the length of each side of the cube is tripled, how much **more** paint must be used to cover it (in square centimeters)?

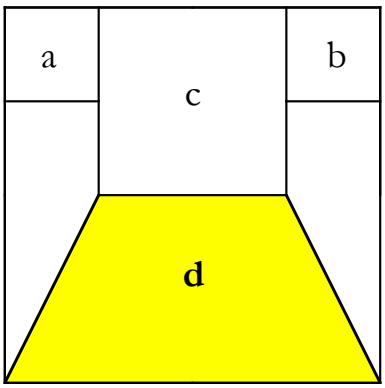


# Whatcom County Math Championship – 2012
# Geometry – 6th Grade

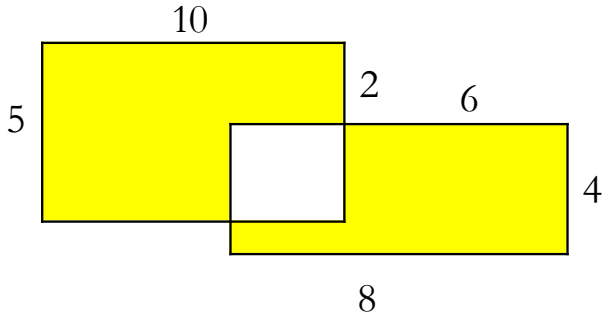
1. Find the area of this triangle, if each small square is one unit.



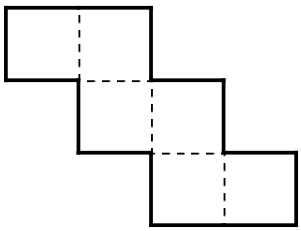
2. In the large square below, the areas marked **a** and **b** are each 4, and the area of **c** is 16. What is the area of the trapezoid marked **d**?



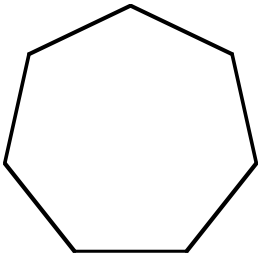

3. Find the area of the shaded region below:



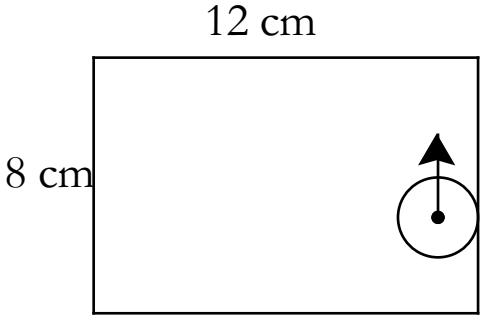

4. Below is the net of a cube (if you folded it on the dotted lines, you would get a cube). The surface area of the net is 150 square units. What is the volume of the cube?



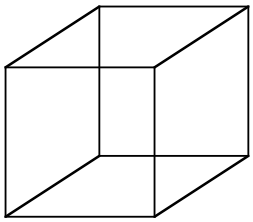
5. How many diagonals are there in this heptagon?



6. A circle with radius 1 cm is inside a rectangle that is 8 cm by 12 cm. The circle rolls once around the rectangle without slipping, always touching at least one side until it returns to its starting point. Find the distance traveled by the center of the circle, in centimeters.



7. The cube below is painted with red paint. If the length of each side of the cube is tripled, how much **more** paint must be used to cover it (in square centimeters)?




8. Annie arranged pennies on a table in the figures below; how many pennies would there be in figure 6 if the pattern continues?

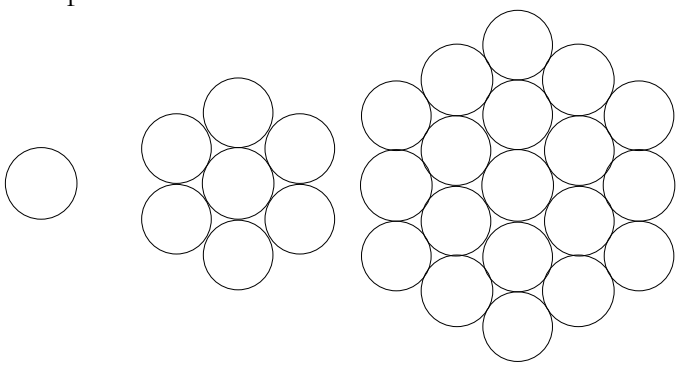
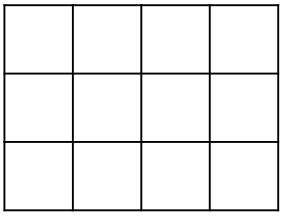
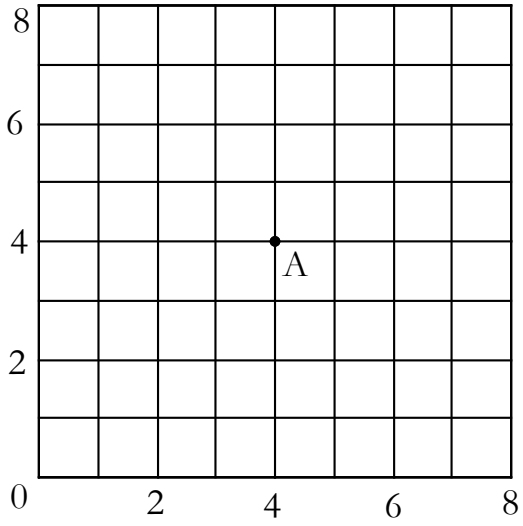


figure 1 figure 2 figure 3

9. How many rectangles are there of all sizes in the figure below (squares count as rectangles)?

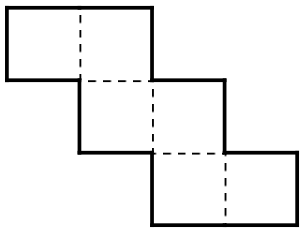


10. The *taxicab distance* from one point to another is the shortest distance between the two points traveling only up or down or side to side along the grid. From the point A on the grid, all the points that are taxicab distance of 2 form a shape; what is the area of this shape?

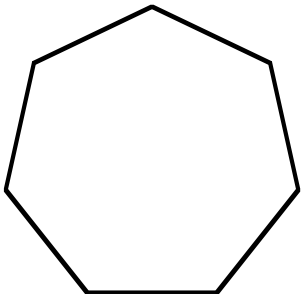


# Whatcom County Math Championship – 2012
# Geometry – 7th + 8th Grade

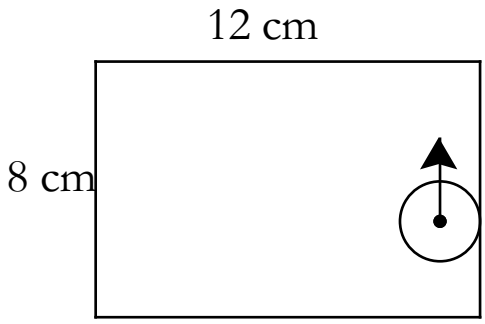
1. Below is the net of a cube (if you folded it on the dotted lines, you would get a cube). The surface area of the net is 150 square units. What is the volume of the cube?



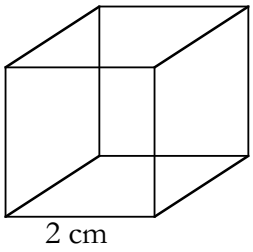
2. How many diagonals are there in this heptagon?



3. A circle with radius 1 cm is inside a rectangle that is 8 cm by 12 cm. The circle rolls once around the rectangle without slipping, always touching at least one side until it returns to its starting point. Find the distance traveled by the center of the circle, in centimeters.




4. The cube below is painted with red paint. If the length of each side of the cube is tripled, how much **more** paint must be used to cover it (in square centimeters)?




5. Annie arranged pennies on a table in the figures below; how many pennies would there be in figure 6 if the pattern continues?

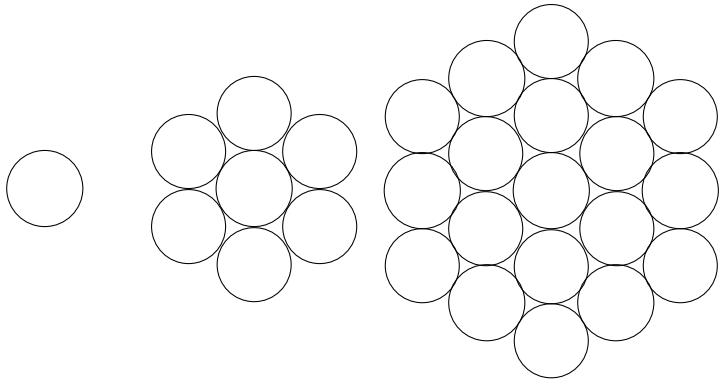
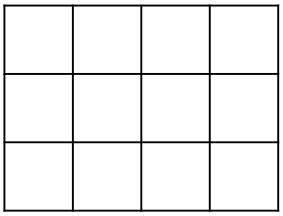
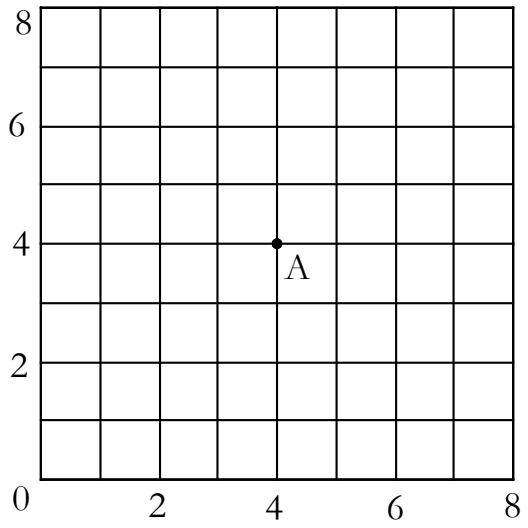


figure 1 figure 2 figure 3

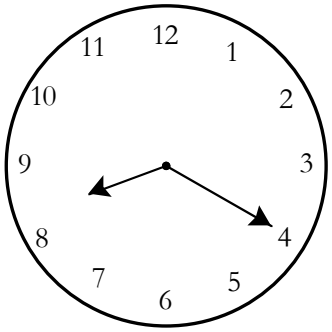
6. How many rectangles are there of all sizes in the figure below (squares count as rectangles)?



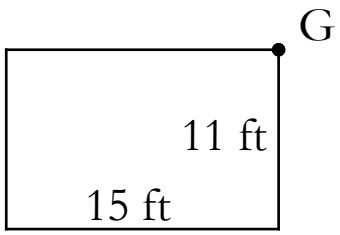
7. The *taxicab distance* from one point to another is the shortest distance between the two points traveling only up or down or side to side along the grid. From the point A on the grid, all the points that are taxicab distance of 2 form a shape; what is the area of this shape?




8. What is the angle in degrees between the hour hand and the minute hand at 8:20?




9. Grace's goat, Gigi, is tethered to the barn below at point G. She is attached to the outside of a barn with 12 feet of rope. To the nearest square foot, how much grazing ground does Gigi have? (Use 3.14 for pi).




10. In the picture below, a = 63° and b = 61°. How many degrees are in angle x?