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

Geometry Homework

Basic problems

1. Complete.

1. Find the area of the parallelogram whose vertices are (-1, -3), (-3, -7), (4, -3), and (2, -7)	2. Find the area of the square whose vertices are (6, 0), (6, 5), (1, 5), and (1, 0)
3. Find the area of the triangle whose vertices are (-11, 4), (-7, 8), and (-7, 4)	4. Find the area of the trapezoid whose vertices are (3, 6), (10, 6), (3, 1), and (6, 1)

2. Find the missing measurement of each trapezoid.

1. *height* = 7 2/3 m b_1 = _____ b_2 = 3 1/2 m *area* = 44 1/12 m^2	2. *height* = _____ b_1 = 11 cm b_2 = 3 2/3 cm *area* = 31 7/9 cm^2	3. *height* = 1 1/2 m b_1 = 9 5/6 m b_2 = _____ *area* = 9 5/8 m^2

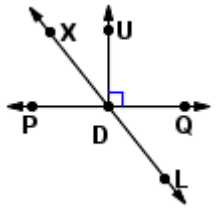
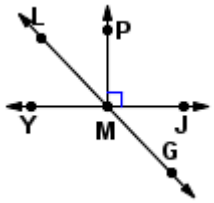
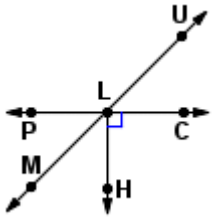
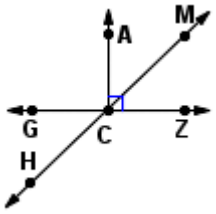
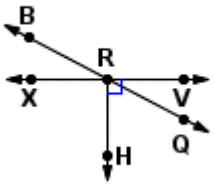
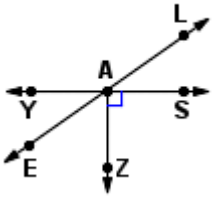
3. Find the missing length for each right triangle. Simplify your answer.

1. $a = 7$ b = _____ $c = 25$	2. a = _____ $b = 15$ $c = \sqrt{586}$	3. $a = 14$ $b = 38$ c = _____

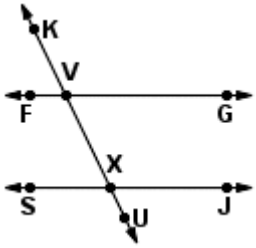
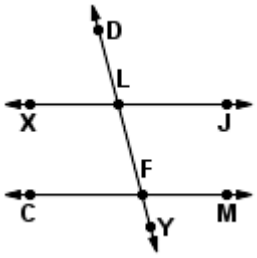
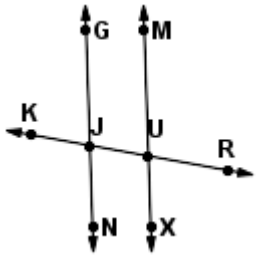
4. Find the circumference and area of each circle. State your answer in terms of π.

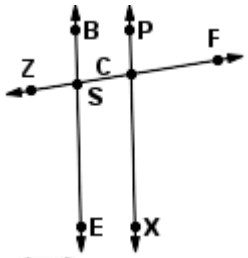
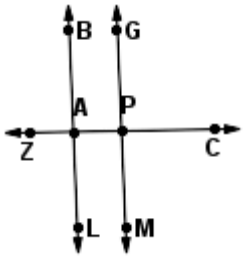
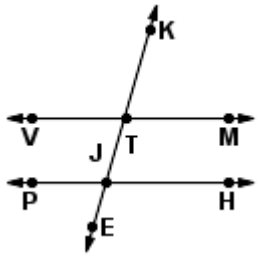
1. radius = 7/2 mm	2. radius = 16.98 mm	3. diameter = 12.56 m

5. Complete

1.  Name a pair of vertical angles.	2.  Name a pair of supplementary angles.	3.  Name a pair of adjacent angles.
4.  Name a pair of supplementary angles.	5.  Name a pair of adjacent angles.	6.  Name a pair of complementary angles.

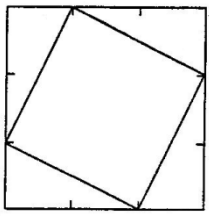
6. Complete

1.  $\overleftrightarrow{FG} \parallel \overleftrightarrow{SJ}$ m ∠GVX = m ∠KVG = 64 °	2.  $\overleftrightarrow{XJ} \parallel \overleftrightarrow{CM}$ m ∠XLF = m ∠LFM = 75 °	3.  $\overleftrightarrow{GN} \parallel \overleftrightarrow{MX}$ m ∠KJN = m ∠MUR = 110 °

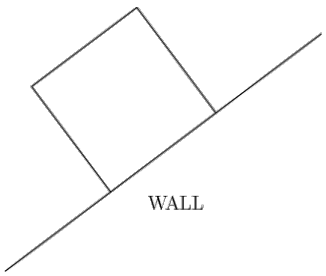
4.  $\overleftrightarrow{BE} \parallel \overleftrightarrow{PX}$ $m\angle PCF =$ $m\angle ESC = 89°$	5.  $\overleftrightarrow{BL} \parallel \overleftrightarrow{GM}$ $m\angle APM =$ $m\angle APG = 81°$	6.  $\overleftrightarrow{VM} \parallel \overleftrightarrow{PH}$ $m\angle PJT =$ $m\angle MTJ = 74°$

Challenge problems

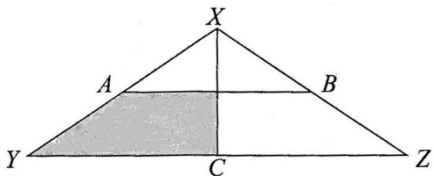
1. Each side of the large square in the figure is trisected (divided into three equal parts). The comers of an inscribed square are at these trisection points, as shown. What is the ratio of the area of the inscribed square to the area of the large square?



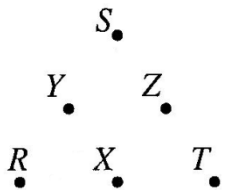
2. A rectangular grazing area is to be fenced off on three sides using part of a 100 meter rock wall as the fourth side. Fence posts are to be placed every 12 meters along the fence including the two posts where the fence meets the rock wall. What is the fewest number of posts required to fence an area 36 m by 60 m?



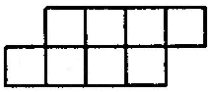
3. The area of triangle XYZ is 8 square inches. Points A and B are midpoints of congruent segments XY and XZ. Altitude XC bisects YZ. Find the area (in square inches) of the shaded region.



4. Points R. S and T are vertices of an equilateral triangle, and points X. Y and Z are midpoints of its sides. How many non-congruent triangles can be drawn using any three of these six points as vertices?

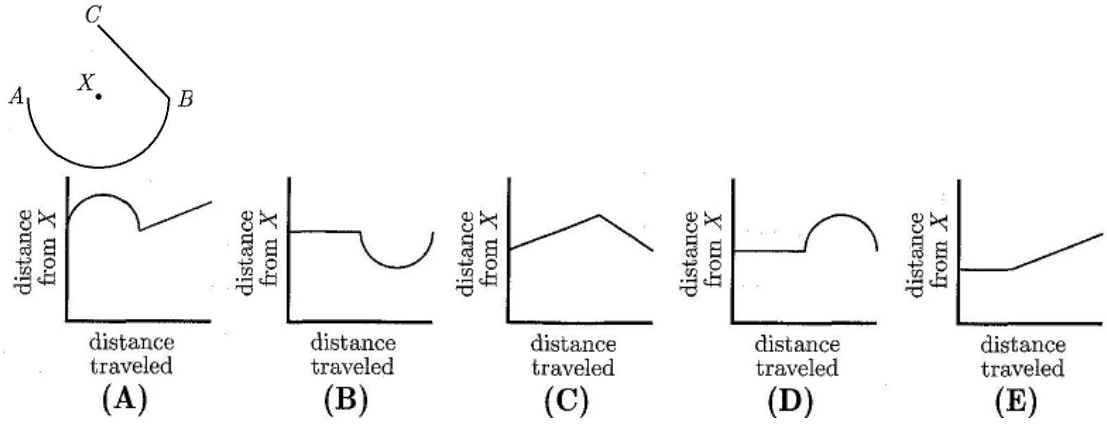


5. Eight 1 × 1 square tiles are arranged as shown so their outside edges form a polygon with a perimeter of 14 units. Two additional tiles of the same size are added to the figure so that at least one side of each tile is shared with aside of one of the squares in the original figure. Which of the following could be the perimeter of the new figure?



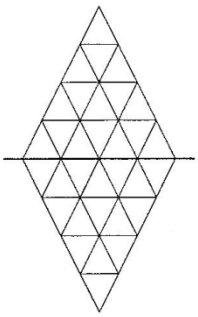
(A) 15 (B) 17 (C) 18 (D) 19 (E) 20

6. A ship travels from point A to point B along a semicircular path. Centered at Island X. Then it travels along a straight path from B to C. Which of these graphs best shows the ship's distance from Island X as it moves along its course?

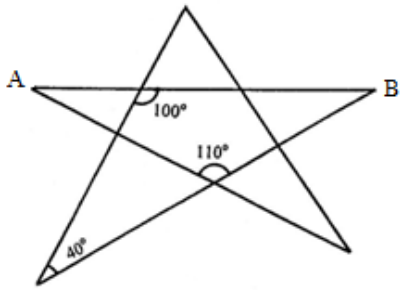


7. Each half of this figure is composed of 3 red triangles, 5 blue triangles and 8 white triangles. When the upper half is folded down over the centerline, 2 pairs of red triangles coincide, as do 3 pairs of blue triangles. There are 2 red-white pairs. How many white pairs coincide?

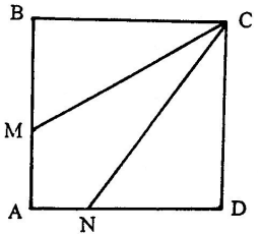
(A) 4 (B) 5 (C) 6 (D) 7 (E) 9



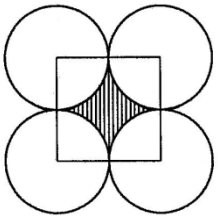
8. What is the degree measure of angle A?



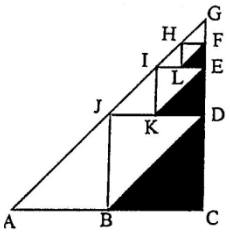
9. Square ABCD has sides of length 3. Segments CM and CN divide the square's area into three equal parts. How long is segment CM?



10. Four circles of radius 3 are arranged as shown. Their centers are the vertices of a square. What is the area of the shaded region?



11. Points B, D, and J are midpoints of the sides of right triangle ACG. Points K, E, I are midpoints of the sides of triangle JDG, etc. If the dividing and shading process is done 100 times (the first three are shown) and AC = CG = 6, then what is the total area of the shaded triangles?



12. In parallelogram ABCD, DE is the altitude to the base AB and DF is the altitude to the base BC. [Note: Both pictures represent the same parallelogram.] If DC=12, EB=4 and DE=6, then DF= ?