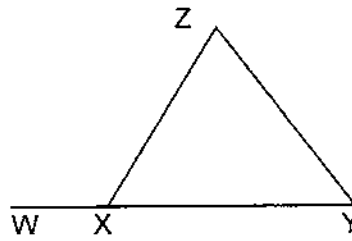


Geometry Team Question #1
Vero Beach Invitational, January 24, 2004

Given: Points W, X, Y are collinear
 $m\angle WXZ = 130$
 $m\angle XYZ = 4h + 30$
 $m\angle YZX = 3h - 40$

Find the value of h .



Geometry Team Question #2
Vero Beach Invitational, January 24, 2004

Raul is pouring cement to fill a sidewalk around a square garden of diagonal length $10\sqrt{2}$. Find the arithmetic mean of the exterior and interior perimeters of the sidewalk if the sidewalk is 2.5 feet wide.

Geometry Team Question #3
Vero Beach Invitational, January 24, 2004

Two vertical poles are planted in the level ground at point A and point B. A rope is stretched from the top of the pole at point A to the bottom of the pole at point B, and a second rope is stretched from the top of the pole at point B to the bottom of the pole at point A. At what height above the ground do the ropes cross if the height of the pole at point A is 196 feet and the height of the pole at point B is 232 feet? Express your answer as a simplified mixed number.

Geometry Team Question #4
Vero Beach Invitational, January 24, 2004

One quadrilateral contains vertices at $A(5,5)$, $B(5,-3)$, $C(-3,5)$, and $D(-3,-3)$. A second quadrilateral contains vertices at $J(0,4)$, $K(0,-2)$, $L(3,1)$, and $M(-3,1)$. Find the positive difference between the two quadrilaterals' areas.

Geometry Team Question #5
Vero Beach Invitational, January 24, 2004

A solid silver rectangular prism of length 4, width 16, and height 8 is melted down and remade as a cube of edge length x . What is the value of x if the two shapes have the same volume?

Geometry Team Question #6
Vero Beach Invitational, January 24, 2004

Let A = the area of an equilateral triangle with side length 6
Let B = the longer diagonal of rhombus with sides 10 and one angle with a measure of 60 degrees
Let C = the number of sides in an icosagon
Let D = the ratio of the lengths of the sides of two similar triangles if the ratios of their areas is $9/1$

Find the value of $\left(\frac{A}{B}\right) \cdot C + D$

Geometry Team Question #7
Vero Beach Invitational, January 24, 2004

The perimeter of a regular hexagon, the area of a square, and the length of one side of an equilateral triangle are all equal. If the perimeter of the square is 360, find the sum of the side lengths of the three shapes.

Geometry Team Question #8
Vero Beach Invitational, January 24, 2004

The y-intercept of the line $2x - 3y = 1$ equals $(0, A)$

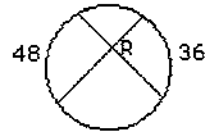
The slope of $4y + 1 = 2x$ equals B

The midpoint of the line segment with endpoints $(2, -6)$ and $(3, 4)$ is (C, D)

Find the value of $A \cdot D + \frac{B}{C}$

Geometry Team Question #9
Vero Beach Invitational, January 24, 2004

Let X = the number of sides of a polygon with 189 diagonals,
Y = the measure of the angle marked R in the diagram at right,
and the prime factorization of $Y = 2^1 \times 3^1 \times Z^1$,



Find the value of $\frac{Y}{X} + Z$.

Geometry Team Question #10
Vero Beach Invitational, January 24, 2004

Triangle ABC has sides $AB = 24$, $BC = 7$, and $CA = 25$.

Triangle DEF is similar to triangle ABC and has side $EF = 14$.

Isosceles triangle GHI has base angles of 60 degrees and legs of length 90 units.

A = the area of triangle DEF

B = the area of triangle GHI

Find the value of $B - A\sqrt{3}$.

Geometry Team Question #11
Vero Beach Invitational, January 24, 2004

G = the length of the diagonal of the square with perimeter 4

H = the length of the altitude of an equilateral triangle with perimeter $6\sqrt{6}$

I = the number of days it takes Mark to climb out of a 21 foot ravine if every day he climbs 3 feet and every night he slips 2 feet

J = the measure of the complement of the smaller acute angle in a right triangle with acute angles in the ratio 1:4

Find the value of $\frac{G}{H} \cdot J + I$.

Geometry Team Question #12
Vero Beach Invitational, January 24, 2004

Find the inverse of the converse of the converse of the contrapositive of the inverse of the converse of the inverse of the statement: "If So-And-So goes to the thrift store, then she meets a possum."

Geometry Team Question #13
Vero Beach Invitational, January 24, 2004

Laenja is inside a vast circular dome of diameter 90 feet. She begins walking out from the center. Every day she walks 3 feet North, and every night she walks 4 feet West. On what day will Laenja reach the wall of the dome?

Geometry Team Question #14
Vero Beach Invitational, January 24, 2004

Find the length of the apothem of the equilateral triangle whose area and the area of an equilateral triangle of side length 3 are in the ratio 4 to 9.

Geometry Team Question #15
Vero Beach Invitational, January 24, 2004

A circle has chords AB and CD, which intersect internally at point O. Line segment AO is 6 units long, OB is 8 units long, and CO is 4 units long. What is the value of the length of segment CD plus the length of segment AB?