Name:_____ Introduction to Geometry

1. What is the volume of a pyramid whose base is a regular pentagon with an area of 60 m^2 and whose height is 10 m?

2. What is the value of F + V - E for a prism whose cross-section is a heptagon?

3. A torus has the following values R = 15 m and r = 4 m. What is the volume of the torus?

4. AB is an arc of length 14 in. on the circumference of a circle with center C.
The size of angle ACB is 3.5 radians. Find the radius of the circle.

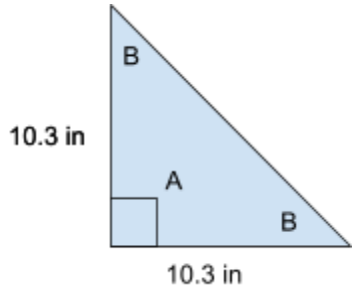
Arc Length Formula:
$L = \theta \times r$

Variables:
(Arc length) L = 14 in.
(Angle ACB) θ = 3.5 radians
(Radius) r = ?

5. BC is an arc with a length of 72 feet on the circumference of a circle with the center D and a diameter of 24 feet. What is the size of the angle BDC in radians?

6. Convert $2\pi/4$ radians to degrees.

7. The following isosceles triangle has two equal sides, each with a length of 10.3. Angle A is a right angle. What is the size of the missing angle "B"?

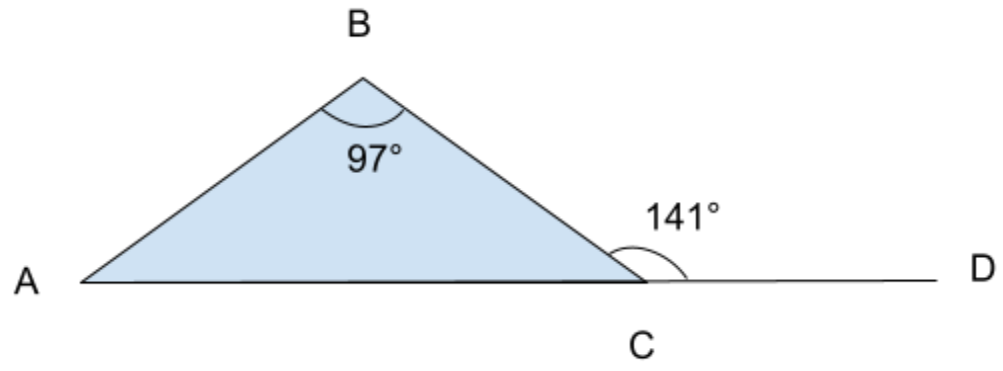


8. Find the side length of a parallelogram with perimeter of 22 in. and base of 8.3 in.?

Parallelogram Perimeter Formula:
$P = 2(b + s)$

Variables:
(Perimeter) $P = 22$
(Base) $b = 8.3$
(Side) $s = ?$

9. In the following diagram, what is the size of angle BAC?



Exterior Angle Theorem:
$\angle BAC = \angle BCD - \angle ABC$

10. What is the surface area for a regular tetrahedron when the total length of the edges is 48 mm? Round to the nearest 1/100th

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ANSWERS:

1.

Volume of a Pyramid = ⅓ x [Base Area] x Height

Volume of a Pyramid = ⅓ x 60 m^2 x 10 m

Volume of a Pyramid = 200 m^3

2.

Draw a heptagon prism. The prism has 9 Faces, 14 Vertices and 21 Edges.

F + V - E = 9 +41 - 21 = 2

3.

Torus Volume = 2 x $\boldsymbol{\pi}^2$ x R x r^2 m^3

Torus Volume = 2 x $\boldsymbol{\pi}^2$ x 15 x 16 m^3

Torus Volume = 4,737.41 m^3

4.

14 = 3.5 × r

r = 14 ÷ 3.5

Radius = 4 in.

5.

L = θ x r

72 = θ x (½ x 24)

72 = θ x 12

θ = 72 ÷ 12

θ = 6 radians

6.

Degrees = 2$\boldsymbol{\pi}$/4 radians

Degrees = [(2 x 180°)/4]

Degrees = 360°/4

2$\boldsymbol{\pi}$/4 Radians = 90° Degrees

7.

A = 90°

A + B + B = 180°

$90° + 2B = 180°$
$2B = 180° - 90°$
$2B = 90°$
$B = 90°/2$
$B = 45°$

8.
$22 = 2(8.3 + s)$
$11 = 8.3 + s$
$8.3 + s = 11$
$s = 2.7$
Side length = 2.7 in.

9.
$BAC = 141° - 97°$
$BAC = 44°$

10.
One Edge Length = 48 mm ÷ 6 = 8 mm
Tetrahedron Surface Area = $\sqrt{3}$ x [Edge Length]^2
Tetrahedron Surface Area = $\sqrt{3} \times 8^2$ mm^2
Tetrahedron Surface Area = 1.732… x 64 mm^2