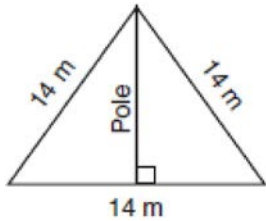


G.SRT.C.8: 30-60-90 Triangles 1a

- 1 In a right triangle where one of the angles measures 30° , what is the ratio of the length of the side opposite the 30° angle to the length of the side opposite the 90° angle?
- 1) $1:\sqrt{2}$
 - 2) $1:2$
 - 3) $1:3$
 - 4) $1:\sqrt{3}$

- 2 The accompanying diagram shows two cables of equal length supporting a pole. Both cables are 14 meters long, and they are anchored to points in the ground that are 14 meters apart.

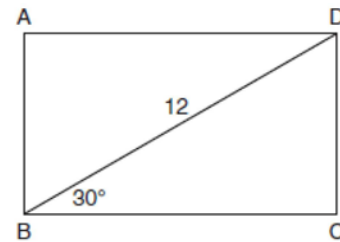


What is the exact height of the pole, in meters?

- 1) 7
 - 2) $7\sqrt{2}$
 - 3) $7\sqrt{3}$
 - 4) 14
- 3 What is the length of the altitude of an equilateral triangle whose side has a length of 8?
- 1) 32
 - 2) $4\sqrt{2}$
 - 3) $4\sqrt{3}$
 - 4) 4
- 4 What is the perimeter of an equilateral triangle whose height is $2\sqrt{3}$?
- 1) 6
 - 2) 12
 - 3) $6\sqrt{3}$
 - 4) $12\sqrt{3}$

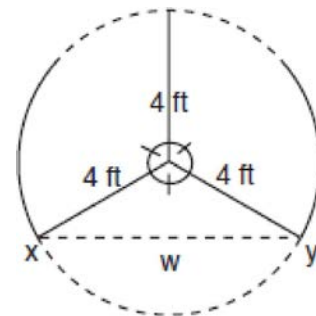
- 5 If the perimeter of an equilateral triangle is 18, the length of the altitude of this triangle is
- 1) 6
 - 2) $6\sqrt{3}$
 - 3) 3
 - 4) $3\sqrt{3}$

- 6 The diagram shows rectangle $ABCD$, with diagonal \overline{BD} .



What is the perimeter of rectangle $ABCD$, to the nearest tenth?

- 1) 28.4
 - 2) 32.8
 - 3) 48.0
 - 4) 62.4
- 7 The accompanying diagram shows a revolving door with three panels, each of which is 4 feet long. What is the width, w , of the opening between x and y , to the nearest tenth of a foot?



G.SRT.C.8: 30-60-90 Triangles 1a
Answer Section

1 ANS: 2 REF: 011019b

2 ANS: 3

The altitude of an equilateral triangle is also a median. Therefore the distance from the pole to the anchor points in the ground is 7. Since each angle of an equilateral triangle is 60° , each of the smaller triangles is a 30-60-90 triangle. Since the hypotenuse is 14, the length of the pole is $7\sqrt{3}$.

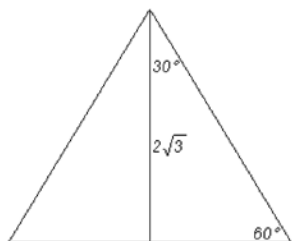
REF: 080504b

3 ANS: 3

The altitude of an equilateral triangle is also a median, and creates a 30-60-90 triangle. If the hypotenuse is 8, the altitude is $4\sqrt{3}$.

REF: 080914b

4 ANS: 2



An equilateral triangle bisected by an altitude (its height) creates two 30° - 60° - 90° triangles. In a 30° - 60° - 90° triangle, the longer leg and the hypotenuse are in the ratio $\sqrt{3}:2$. Applying

this ratio to the triangle, $\frac{\sqrt{3}}{2} = \frac{2\sqrt{3}}{h}$. If one side of a triangle is 4, the perimeter is 12. Alternatively,

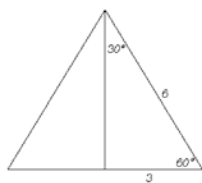
$$h = 4$$

$$\sin 60 = \frac{2\sqrt{3}}{h}$$

$$h = 4$$

REF: 089920a

5 ANS: 4



An equilateral triangle bisected by an altitude creates two 30° - 60° - 90° triangles. In a 30° - 60° - 90° triangle, the longer leg and the hypotenuse are in the ratio $\sqrt{3}:2$. Applying this ratio to the

$$\begin{aligned} \frac{\sqrt{3}}{2} &= \frac{a}{6} & \text{Alternatively, } \sin 60 &= \frac{a}{6} & \text{Alternatively,} & & a^2 + 3^2 &= 6^2 \\ a &= 3\sqrt{3} & a &= 3\sqrt{3} & a &= \sqrt{27} & & \\ & & & & &= \sqrt{9} \sqrt{3} & & \\ & & & & &= 3\sqrt{3} & & \end{aligned}$$

REF: 080613b

6 ANS: 2

$$6 + 6\sqrt{3} + 6 + 6\sqrt{3} \approx 32.8$$

REF: 011709geo

7 ANS:

If the center of the circle is labeled O , $\angle XOY = 120^\circ$ because the circle is divided into three equal parts. An altitude drawn from O to drawn \overline{XY} creates a 30 - 60 - 90 triangle. Since the hypotenuse is 4 , the longer leg is $2\sqrt{3}$. Therefore $w = 4\sqrt{3} \approx 6.9$

REF: 010722b