

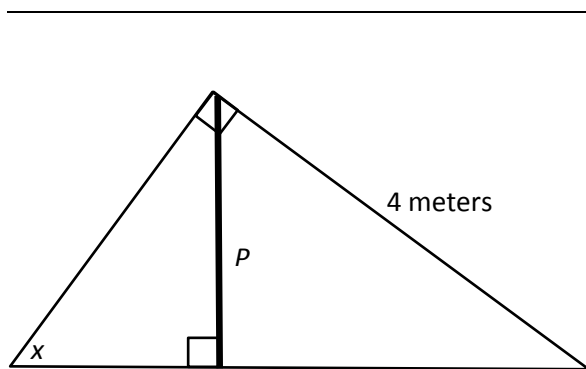
Math: Additional Topics in Math

Practice for the New SAT (2016)

Problem Set 4: 8 Questions

Math: Additional Topics in Math

- The volume of a sphere is calculated using the formula $V = \frac{4}{3}\pi r^3$. A sphere with a diameter of 3 is inside a cube, and it touches the cube at six points. What is the volume of space in the cube that is not being occupied by the sphere?
 - 36π
 - $36 - 4.5\pi$
 - $27 - 4.5\pi$
 - $9 - 4.5\pi$



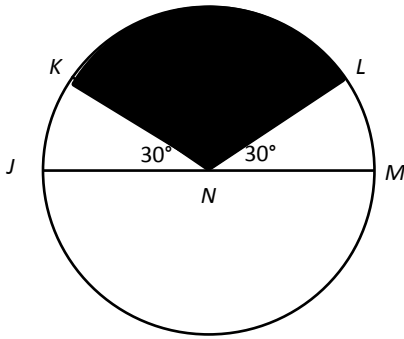
- The diagram above shows a tent supported by an inner pole. If $x = 60^\circ$, what is the height of the pole, P , in meters?
 - 1
 - 2
 - $\frac{4}{\sqrt{3}}$
 - $\frac{8}{\sqrt{3}}$

- Simplify the following expression:

$$i^2 - 5i^3$$

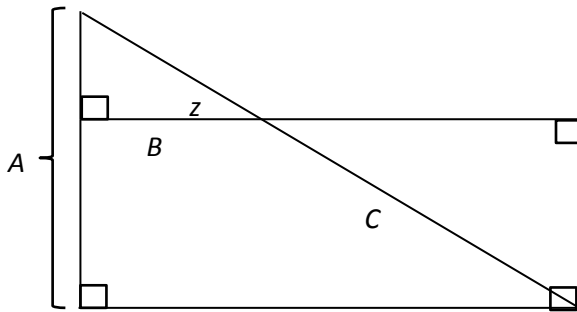
- $1 - 5i$
- $5i - 1$
- $6i$
- -4

-
- A circle has a radius of 1. A sector of the circle has an arc length of $\pi/3$. How many degrees is the central angle of the sector?



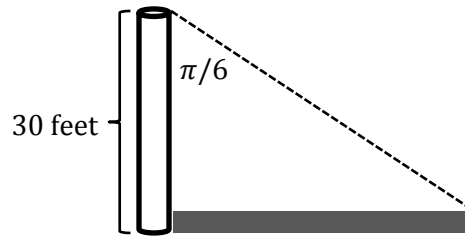
5. The center of the circle above is point N , and its diameter is 10. Points J , N , and M lie on a line. What is the area of the shaded sector?

- (A) $\frac{100\pi}{6}$
 (B) $\frac{100\pi}{3}$
 (C) $\frac{25\pi}{3}$
 (D) 25π



6. In the figure above, $z = 30^\circ$, $B = 10$, and $C = 30$. What is the value of A ?

- (A) $15 + \frac{10}{\sqrt{2}}$
 (B) $15 + \frac{10}{\sqrt{3}}$
 (C) $10 + \frac{15}{\sqrt{3}}$
 (D) $10 + \frac{20}{\sqrt{3}}$



7. A pole is 30 feet tall. In the diagram above, the pole casts a shadow at an angle of $\pi/6$ radians from the top of the pole. What is the length in feet of the pole's shadow?

- (A) $30 \times \tan\left(\frac{\pi}{6}\right)$
 (B) $\tan\left(\frac{\pi}{6}\right) \div 30$
 (C) $30 \times \sin\left(\frac{\pi}{6}\right)$
 (D) $\cos\left(\frac{\pi}{6}\right) \div 30$

8. A circle is defined by the equation $(x - 1)^2 + (y - 2)^2 = 36$. The center of the circle has coordinates (j, k) . What is the value of j ?

Summary

8 Questions	
0 Easy, 2 Medium, 6 Hard	Estimated Time: 20 minutes

Answers

Answers	Difficulty	Topic	Other Topics
1) C	Medium	Solve problems using volume formulas.	
2) B	Hard	Use trigonometric ratios and the Pythagorean Theorem to solve applied problems involving right triangles.	
3) B	Hard	Perform arithmetic operations on complex numbers.	
4) 60	Hard	Convert between degrees and radians and use radians to determine arc lengths.	
5) C	Hard	Apply theorems about circles to find areas of sectors.	
6) B	Medium	Use theorems about congruence and similarity to determine missing lengths of triangles.	
7) A	Hard	Use trigonometry and theorems about triangles to determine a missing length that would satisfy a given theorem.	
8) 1	Hard	Use the properties of an equation of a circle to determine a property of the circle's graph.	