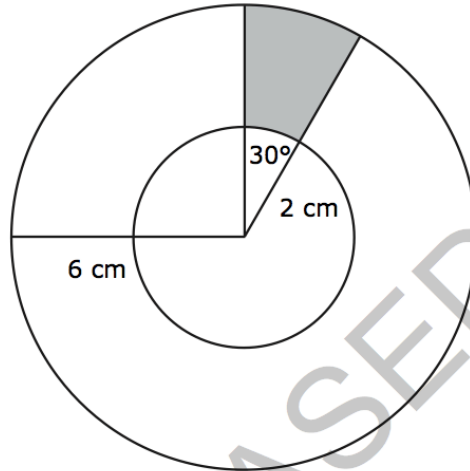


Released Exam Questions

- 1 Which expression is equivalent to $(x + 3)^3 - 9x(x + 3)$?
- A $x^3 + 27$
- B $x^3 - 27$
- C $x^3 - 9x^2 - 27x + 27$
- D $x^3 - 9x^2 + 27x + 27$
- 2 Suppose $p(x) = x^3 - 2x^2 + 13x + k$. The remainder of the division of $p(x)$ by $(x + 1)$ is -8 . What is the remainder of the division of $p(x)$ by $(x - 1)$?
- A -8
- B 8
- C 16
- D 20
- 5 Which is an equation of a parabola that has a directrix of $y = -5$ and a focus at $(2, -1)$?
- A $y = \frac{1}{2}(x + 2)^2 + 2$
- B $y = \frac{1}{8}(x + 2)^2 + 3$
- C $y = \frac{1}{8}(x - 2)^2 - 3$
- D $y = \frac{1}{2}(x - 2)^2 - 2$
- 8 Which choice shows the solutions to the equation $8x^2 + 3x = -7$?
- A $\frac{-3 \pm i\sqrt{215}}{16}$
- B $\frac{3 \pm i\sqrt{215}}{16}$
- C $\frac{-3 \pm \sqrt{233}}{16}$
- D $\frac{3 \pm \sqrt{233}}{16}$

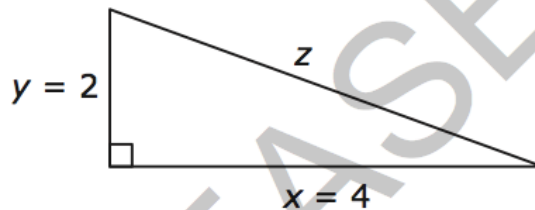
- 7 In the figure below, the larger circle has a radius of 6 cm, and the smaller circle has a radius of 2 cm.



- What is the **approximate** area of the shaded region?
- A 2.1 cm²
B 3.4 cm²
C 4.2 cm²
D 8.4 cm²
- 13 What value of h is needed to complete the square for the equation $x^2 + 10x - 8 = (x - h)^2 - 33$?
- A -25
B -5
C 5
D 25
- 11 A student wants to determine the most liked professor at her college. Which type of study would be the **most** practical to obtain this information?
- A a simulation
B an experiment
C a survey
D an observation

- 12 A principal wants to survey 150 students to determine which electives to offer during the next school year. There are 1,800 students in the school. Which procedure could the principal use to select a sample using a systematic random sample?
- A Obtain a list of all students. Start with the eighth student, and select every twelfth student until 150 students have been selected.
 - B Select the first 150 students who enter the school.
 - C Choose the fifth student to come into the cafeteria, and then select every third student who comes into the cafeteria until 150 students have been selected.
 - D Place students' names on slips of paper and select 150 slips.
- 17 A town has 685 households. The number of people per household is normally distributed with a mean, μ , of 3.67 and a standard deviation, σ , of 0.34. **Approximately** how many households have between 2.99 and 4.01 people?
- A 493 households
 - B 520 households
 - C 558 households
 - D 575 households

- 24 A right triangle is shown below.



Which expression would result in an irrational number?

- A $x^2 + y^2$
 - B $\frac{1}{2}xy$
 - C $x + y + z$
 - D $x^2 - z^2$
- 23 The volume of a rectangular prism is represented by the expression $(x^3 - 2x^2 - 20x - 24)$. If the length is $(x - 6)$ and the height and width are equal, what is the width of the prism?
- A $x + 2$
 - B $x - 2$
 - C $x + 4$
 - D $x - 4$

- 1 The function f is defined as $f(x) = 6x^4 + x^3 + 4x^2 + x - 2$.
- Using the Remainder Theorem, determine if $\frac{1}{2}$ is a root of $f(x)$. Explain.

25 Which expression is equivalent to $(4 - 3i)^2 + (6 + i)^2$?

- A 30
- B $42 - 12i$
- C 50
- D $62 - 12i$

- 3 Given the function:

$$g(x) = \frac{(x - 2)(3x + 2)}{(x + 4)(x - 2)(x - 6)}$$

- What are the equations of the asymptotes of the function?
 - Determine if there are any points of discontinuity. Explain why or why not.
- 16 William put the tip of his pencil on the outer edge of a graph of the unit circle at the point $(0, -1)$. He moved his pencil tip through an angle of $\frac{4\pi}{3}$ radians in the counterclockwise direction along the edge of the circle. At what angle of the unit circle did William's pencil tip stop?

- A $\frac{\pi}{3}$
- B $\frac{5\pi}{6}$
- C $\frac{7\pi}{6}$
- D $\frac{5\pi}{3}$

- 18 The graph of the function $f(x) = x^3$ will be shifted down 2 units and to the right 3 units. Which is the function that corresponds to the resulting graph?

- A $g(x) = (x + 3)^3 + 2$
- B $g(x) = (x + 3)^3 - 2$
- C $g(x) = (x - 3)^3 + 2$
- D $g(x) = (x - 3)^3 - 2$