Given the table below:

x	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π	$\frac{5\pi}{4}$	$\frac{3\pi}{2}$
y	0.5	0	⁻0.5	0	0.5

Which function fits the data?

A $y = 0.5\cos(2x - \pi)$

B $y = 0.5\cos(x - \pi)$

C $y = 0.5\cos\left(2x + \frac{\pi}{2}\right)$
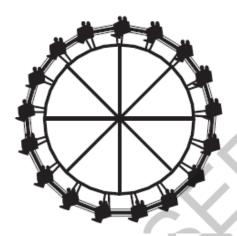
D $y = \cos\left(2x + \frac{\pi}{2}\right)$

In a geometric sequence, $a_1 = 12$ and $r = \sqrt{2}$. What is the **approximate** sum of the first 20 terms of the sequence?

A   339.4

B   8,688.9

C   29,624.9

D   29,636.9

A bathroom floor has tiles arranged in 9 circles. The innermost circle contains 9 tiles. Each successive circle contains 9 more tiles than the previous circle. How many total tiles are on the bathroom floor?

A   81

B   396

C   405

D   729

A Ferris wheel has a diameter of 80 feet. Riders enter the Ferris wheel at its lowest point, 5 feet above the ground, at time $t = 0$ seconds. One complete rotation takes 65 seconds.

Which function models a rider's vertical height, $h(t)$, at t seconds?

A $h(t) = {}^-80\cos\left(\frac{2\pi}{65}t\right) + 5$

B $h(t) = {}^-40\cos\left(\frac{2\pi}{65}t\right) + 45$

C $h(t) = {}^-45\cos\left(\frac{65}{2\pi}t\right) + 40$

D $h(t) = {}^-5\cos\left(\frac{65}{2\pi}t\right) + 80$

How does the graph of $g(x) = 0.5\cos(2x)$ differ from the graph of its parent function, $f(x) = \cos(x)$, over the interval ${}^-\pi \le x \le \pi$?

A   The amplitude is smaller, and the period is shorter.

B   The amplitude is smaller, and the period is longer.

C   The amplitude is larger, and the period is shorter.

D   The amplitude is larger, and the period is longer.

Two sides of a triangle measure 14 ft and 17 ft, respectively. The included angle is 72°. ***Approximately*** how long is the third side of the triangle?

A   18.4 ft

B   20.3 ft

C   25.1 ft

D   30.7 ft

What is the solution to the equation below?

$$\frac{\frac{3}{x} + 2}{\frac{x}{5} + 1} = \frac{15}{x}$$

A   ⁻12

B   ⁻2

C   2

D   12

Which is the solution set for x if $2e^{2x} + 5e^x - 12 = 0$?

A $\left\{\ln\frac{3}{2}, \ln 4\right\}$

B $\left\{\ln\frac{3}{2}, \ln^- 4\right\}$

C $\{\ln 4\}$

D $\left\{\ln\frac{3}{2}\right\}$

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

Which expression is equivalent to $\dfrac{\cos(\theta)}{1 - \sin(\theta)} - \tan(\theta)$?

A $\sec(\theta)$

B $\sin(\theta)$

C $\cos(\theta)$

D $\csc(\theta)$

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 $\dfrac{4\pi}{3}$ 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 $\dfrac{\pi}{3}$

B $\dfrac{5\pi}{6}$

C $\dfrac{7\pi}{6}$

D $\dfrac{5\pi}{3}$

Which is the inverse of $f(x) = 1.5^x + 4$?

A $f^{-1}(x) = \dfrac{x - 4}{1.5}$

B $f^{-1}(x) = \dfrac{\log(x) - 4}{1.5}$

C $f^{-1}(x) = \dfrac{\log(x - 4)}{\log(1.5)}$

D $f^{-1}(x) = \dfrac{4 - \log(x)}{\log(1.5)}$

The recursive formula for a sequence is $U_n = U_{n-1} + 12$, where U_n is the nth term of the sequence and $U_0 = 7$. Which explicit formula can be used to determine the nth term of the sequence?

A $7n + 19$

B $7n + 12$

C $7 + 19n$

D $7 + 12n$

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 $x - 4$

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 $y = \frac{1}{2}(x - 2)^2 - 2$

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.
- Describe the end behavior as x approaches $-\infty$ and as x approaches $+\infty$.

The graph of $f(x) = x^2$ will be translated 5 units up and 2 units to the right. Which function describes the graph produced by the translation?

A $g(x) = x^2 - 4x + 9$

B $g(x) = x^2 + 4x - 1$

C $g(x) = x^2 - 10x + 27$

D $g(x) = x^2 + 10x + 23$