PRINTABLE VERSION

Practice Test 3

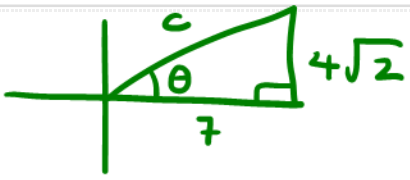
You scored 100 out of 100

Question 1

Your answer is CORRECT.

Suppose that θ is an acute angle of a right triangle and that

$$\tan(\theta) = \frac{4}{7}\sqrt{2}$$



Find sec(θ) and csc(θ).

$(4\sqrt{2})^2 + 7^2 = c^2$

$32 + 49 = c^2$

$c^2 = 81$

$c = 9$

a) $\left[\sec(\theta) = \frac{9}{8}\sqrt{2}, \csc(\theta) = \frac{9}{7}\right]$

b) $\left[\sec(\theta) = \frac{7}{17}\sqrt{17}, \csc(\theta) = \frac{4}{17}\sqrt{34}\right]$

c) $\left[\sec(\theta) = \frac{9}{7}, \csc(\theta) = \frac{9}{8}\sqrt{2}\right]$

$\sec\theta = \frac{9}{7}$

d) $\left[\sec(\theta) = \frac{7}{9}, \csc(\theta) = \frac{4}{9}\sqrt{2}\right]$

$\csc\theta = \frac{9}{4\sqrt{2}} = \frac{9\sqrt{2}}{8}$

e) $\left[\sec(\theta) = \frac{4}{7}\sqrt{2}, \csc(\theta) = \frac{7}{8}\sqrt{2}\right]$

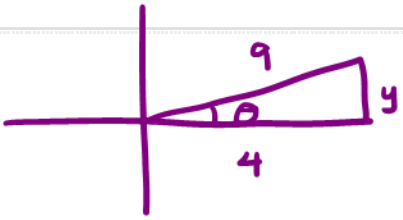
f) None of the above.

Question 2

Your answer is CORRECT.

Suppose that θ is an acute angle of a right triangle and that

$$\sec(\theta) = \frac{9}{4}$$



Find sin(θ) and cot(θ).

$4^2 + y^2 = 9^2$

$y^2 = 81 - 16$

$y = \sqrt{65}$

a) $\left[\sin(\theta) = \frac{9}{65}\sqrt{65}, \cot(\theta) = \frac{4}{65}\sqrt{65}\right]$

b) $\left[\sin(\theta) = \frac{1}{9}\sqrt{65}, \cot(\theta) = \frac{1}{4}\sqrt{65}\right]$

$\sin\theta = \frac{\sqrt{65}}{9}$

c) $\left[\sin(\theta) = \frac{4}{9}, \cot(\theta) = \frac{1}{9}\sqrt{65}\right]$

$\cot\theta = \frac{4}{\sqrt{65}} = \frac{4\sqrt{65}}{65}$

d) $\left[\sin(\theta) = \frac{9}{4}, \cot(\theta) = \frac{9}{65}\sqrt{65}\right]$

e) $\left[\sin(\theta) = \frac{1}{9}\sqrt{65}, \cot(\theta) = \frac{4}{65}\sqrt{65}\right]$

f) None of the above.

Question 3

Your answer is CORRECT.

Convert the following degree measure to radians: 210^o.

a) $21\pi/20$

$\frac{210}{1} \cdot \frac{\pi}{180} = \frac{21\pi}{18} = \frac{7\pi}{6}$

b) $14\pi/3$

c) $7\pi/12$

d) $7\pi/6$

e) $12\pi/7$

f) None of the above.

Question 4

Your answer is CORRECT.

A sector of a circle has central angle $\theta = 4\pi/3$ and area $50\pi/3$ ft^2. Find the radius of the circle.

a) $5/4$ ft

$A = \frac{1}{2}r^2\theta$

b) $5/2$ ft

$\frac{50\pi}{3} = \frac{1}{2}r^2\left(\frac{4\pi}{3}\right)$

c) 20 ft

$\frac{50\pi}{3} = \frac{4\pi}{6}r^2$

d) 5 ft

$r^2 = 25 \Rightarrow r = 5$

e) 10 ft

f) None of the above.

Question 5

Your answer is CORRECT.

A car has wheels with a 12 cm radius. If each wheel's rate of turn is 7 revolutions per second, how fast is the car moving in units of cm/sec?

a) 7π/12

$\frac{7 \text{ revs}}{\text{sec}} \cdot \frac{2\pi}{1 \text{ rev}} \cdot 12\text{cm} = 168\pi$

b) 168π

c) 12π/7

d) 84π

e) 24π

f) None of the above.

Question 6

Your answer is CORRECT.

If the central angle θ defining the sector is given in degrees, then the area of the sector can be found using the formula:

$$A = \frac{\theta}{360^\circ} \cdot \pi r^2$$

Use the formula above to find the area of the sector:

$\theta = 140^\circ$, $r = 6$ cm

a) 28π/3 cm^2

$A = \frac{140}{360} \pi (36) = 14\pi$

b) 14π/3 cm^2

c) 28π cm^2

d) 14π cm^2

e) 7π/3 cm^2

f) None of the above.

Question 7

Your answer is CORRECT.

Convert the following radian measures to degrees:

$$19\pi/10$$

a) $(171/2)^o$

$\frac{19\pi}{10} \cdot \frac{180}{\pi} = 342^\circ$

b) 342^o

c) $(3600/19)^o$

d) 380^o

e) 684^o

f) None of the above.

Question 8

$\theta + n \cdot 360$

Your answer is CORRECT.

Find three angles, two positive and one negative, that are coterminal with the given angle: 100^o

a) $-80^o, 280^o, 460^o$

$100 + (1)\,360 = 460^\circ$

b) $-260^o, 280^o, 820^o$

$100 + (-1)\,360 = -260^\circ$

c) $-260^o, 460^o, 820^o$

$100 + (2)\,360 = 820^\circ$

d) $-280^o, 280^o, 460^o$

e) $-80^o, 460^o, 820^o$

f) None of the above.

Question 9

Your answer is CORRECT.

Evaluate: $\csc(-5\pi/6)$

a) $\sqrt{3}$

b) $-2\sqrt{3}/3$

c) 2

d) -2

e) $2\sqrt{3}/3$

f) None of the above.

$\text{ref}\theta = \frac{\pi}{6}$

$\csc\left(\frac{-5\pi}{6}\right) = -\csc\left(\frac{\pi}{6}\right)$

$= \frac{-1}{\sin(\pi/6)} = \frac{-1}{1/2} = -2$

Question 10

Your answer is CORRECT.

Evaluate: $\sin(-11\pi/6) = -\sin\left(\frac{11\pi}{6}\right) = -\left[-\frac{1}{2}\right] = \frac{1}{2}$

a) $\sqrt{3}/3$

b) $\sqrt{3}/2$

c) $-1/2$

d) $-\sqrt{3}/2$

e) $1/2$

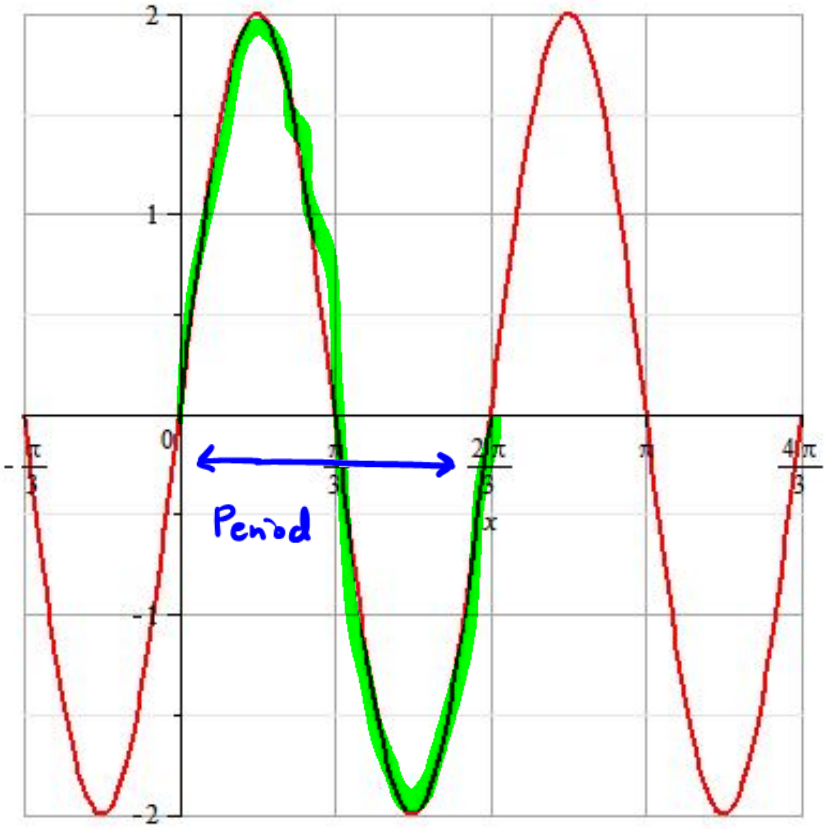
f) None of the above.

$\text{ref}\theta = \frac{\pi}{6}$

Question 11

Your answer is CORRECT.

Find the period for the following function:



a) 2

b) 1/3

c) 3

d) π/3

e) 2π/3

f) None of the above.

Question 12

Your answer is CORRECT.

Find the period for the following function:

$$f(x) = \frac{3}{7}\sin\left(\frac{1}{4}x\right)$$

a) 3π/7

b) π/2

$$\text{Period} = \frac{2\pi}{B} = \frac{2\pi}{1/4} = \frac{2\pi}{1}\cdot\frac{4}{1} = 8\pi$$

c) 8π

d) 4π

e) 14π/3

f) None of the above.

Question 13

Your answer is CORRECT.

Find the period for the following function:

$$f(x) = 6 \sin\left(\frac{1}{5}\pi x + \pi\right) - 4$$

B

$\text{Period} = \frac{2\pi}{B} = \frac{2\pi}{\pi/5} = \frac{2\pi}{1} \cdot \frac{5}{\pi} = 10$

a) 10π

b) π/5

c) 2π/5

d) 10

e) 5

f) None of the above.

Question 14

Your answer is CORRECT.

Find the phase shift for the following function:

$$f(x) = 7 \cos\left(\frac{1}{3}\pi x + \pi\right) + 2$$

B, C = −π

$\text{Phase shift} = \frac{C}{B} = \frac{-\pi}{\pi/3} = \frac{-\pi}{1} \cdot \frac{3}{\pi} = -3$

↑ to the left

a) π left

b) π right

c) 3 left

d) 2 left

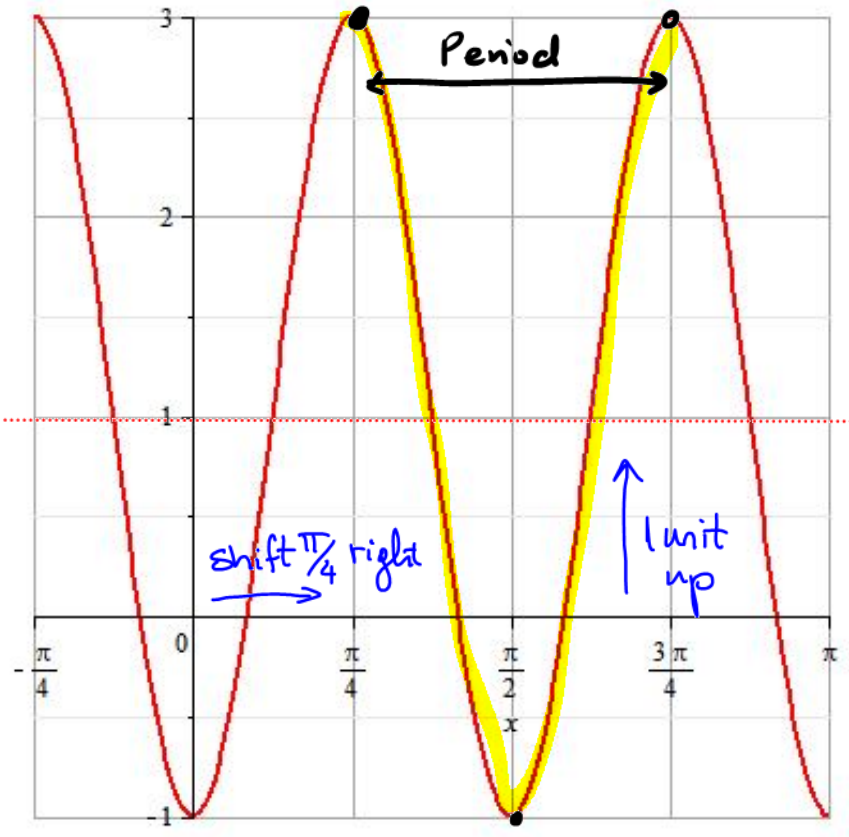
e) 3 right

f) None of the above.

Question 15

Your answer is CORRECT.

Give an equation of the form $f(x) = A\cos(Bx - C) + D$ which could be used to represent the given graph. (Note: C or D may be zero.)



$A = \frac{\max - \min}{2}$

$A = \frac{3 - (-1)}{2}$

$A = 2$

$D = \frac{3 + (-1)}{2}$

$D = 1$

Period $= \frac{2\pi}{B}$

$\frac{\pi}{2} = \frac{2\pi}{B}$

$4\pi = B\pi$

$B = 4$

$\frac{C}{4} = \frac{\pi}{4} = \frac{C}{B}$

$4C = 4\pi$

$C = \pi$

$y = 2\cos(4x - \pi) + 1$

a) $f(x) = 2\cos(4x - \pi) - 1$

b) $f(x) = 2\cos(4x - \pi) + 1$

c) $f(x) = 2\cos(4x - \pi)$

d) $f(x) = 4\cos(4x - \pi) - 1$

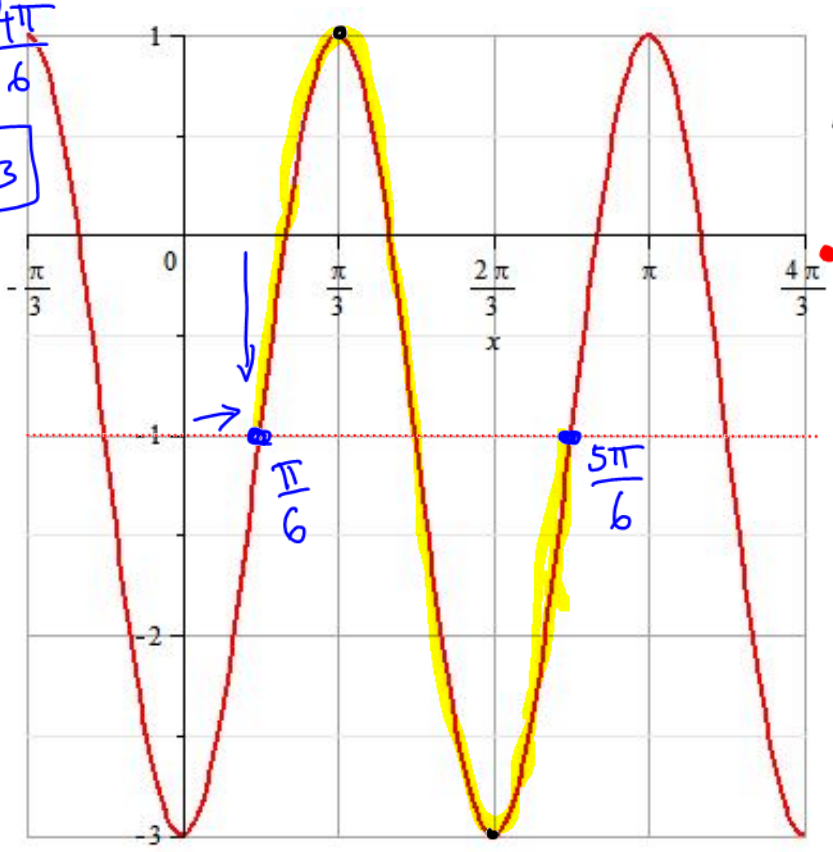
e) $f(x) = 4\cos(4x - \pi) + 1$

f) None of the above.

Question 16

Your answer is CORRECT.

Give an equation of the form $f(x) = A \sin(B x - C) + D$ which could be used to represent the given graph. (Note: C or D may be zero.)



period $= \frac{5\pi}{6} - \frac{\pi}{6} = \frac{4\pi}{6}$

$\frac{4\pi}{6} = \frac{2\pi}{B} \Rightarrow B = 3$

phase shift

$\frac{\pi}{6} = \frac{C}{3}$

$6C = 3\pi$

$C = \frac{\pi}{2}$

amplitude $A = \frac{\max - \min}{2}$

$A = \frac{1-(-3)}{2} = 2$

Vertical Shift

$D = \frac{1+(-3)}{2} = -1$

By graph

$D = -1$

a) $f(x) = 2 \sin\left(3x - \frac{1}{2}\pi\right) - 1$

$f(x) = 2 \sin(3x - \frac{\pi}{2}) - 1$

b) $f(x) = 4 \sin\left(3x - \frac{1}{2}\pi\right) - 1$

c) $f(x) = 2 \sin\left(3x - \frac{1}{2}\pi\right)$

d) $f(x) = 4 \sin\left(3x - \frac{1}{2}\pi\right) + 1$

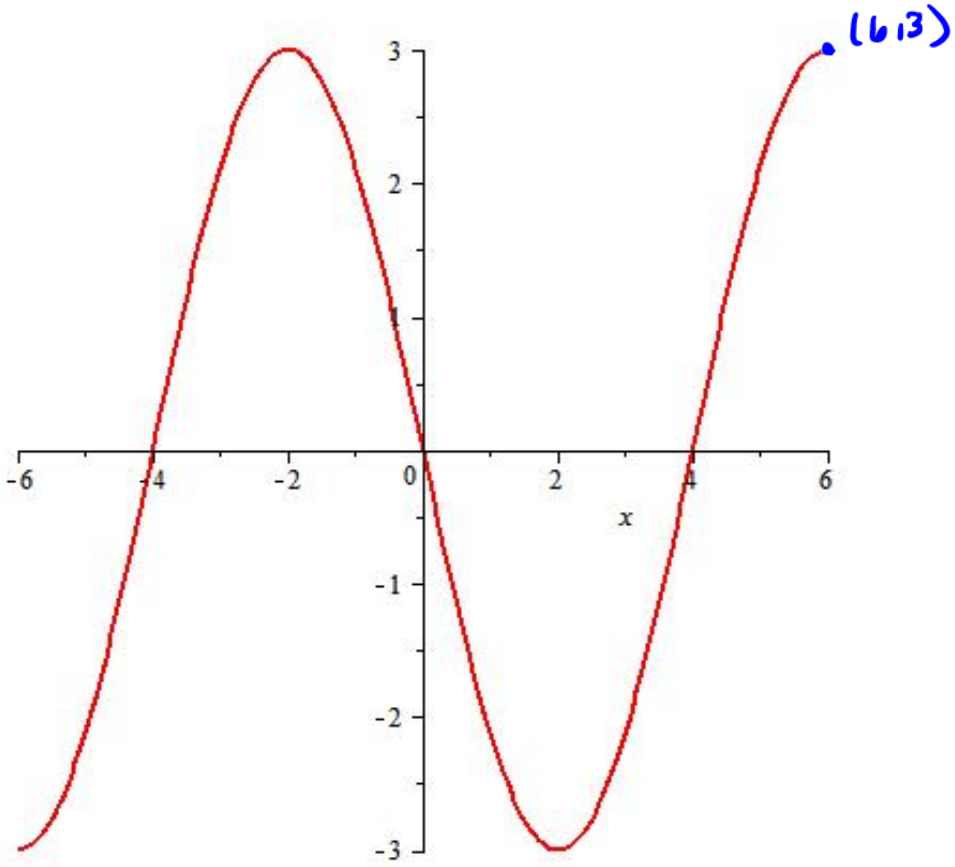
e) $f(x) = 2 \sin\left(3x - \frac{1}{2}\pi\right) + 1$

f) None of the above.

Question 17

Your answer is CORRECT.

Identify the function whose graph is shown below. The point (6 , 3) is on the graph.



a) $f(x) = 3\sin(x)$

b) $f(x) = 3\cos\left(\frac{1}{4}\pi x\right)$

c) $f(x) = -3\sin\left(\frac{1}{4}x\right)$

d) $f(x) = 6\cos\left(\frac{1}{4}\pi x\right)$

e) $f(x) = -3\sin\left(\frac{1}{4}\pi x\right)$

$f(6) = -3\sin\left(\frac{\pi}{4}\cdot 6\right)$

$= -3\sin\left(\frac{6\pi}{4}\right)$

$= -3\sin\left(\frac{3\pi}{2}\right)$

$= -3(-1) = 3$

f) None of the above.

Question 18

Your answer is CORRECT.

Suppose that triangle ABC has $C = 90^o$, $AC = 4$ and $BC = 8$. Find $\cot(A)$ and $\cos(B)$.

a) $\left[\cot(A) = -\frac{1}{2}, \cos(B) = -\frac{2}{5}\sqrt{5}\right]$

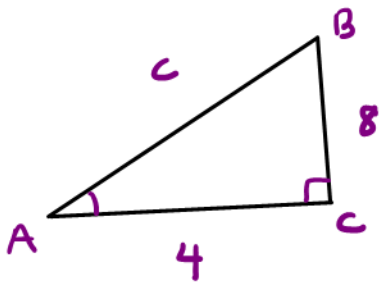
b) $\left[\cot(A) = 4, \cos(B) = 32\sqrt{5}\right]$

c) $\left[\cot(A) = \frac{1}{2}, \cos(B) = \frac{2}{5}\sqrt{5}\right]$

d) $\left[\cot(A) = 2, \cos(B) = \frac{2}{5}\sqrt{3}\right]$

e) $\left[\cot(A) = \frac{1}{2}, \cos(B) = \frac{1}{12}\sqrt{3}\right]$

f) None of the above.



$c^2 = 4^2 + 8^2$

$c^2 = 80$

$c = 4\sqrt{5}$

$\cot A = \frac{4}{8} = \frac{1}{2}$

$\cos B = \frac{8}{4\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{8\sqrt{5}}{20} = \frac{2\sqrt{5}}{5}$

Question 19

Your answer is CORRECT.

Evaluate

$$\frac{(-\cos(240^\circ))}{(\cos(330^\circ))} + \sin(90^\circ)$$

a) $\frac{1}{3}\sqrt{3} - 1$

b) $\sqrt{3} + 1$

c) $\frac{1}{3}\sqrt{3} + \frac{1}{3}$

d) $\sqrt{3} + \frac{1}{2}$

e) $\frac{1}{3}\sqrt{3} + 1$

f) None of the above.

$$\frac{1/2}{\sqrt{3}/2} + 1 = \frac{1}{2} \cdot \frac{2}{\sqrt{3}} + 1$$

$$= \frac{1}{\sqrt{3}} + 1$$

$$= \frac{\sqrt{3}}{3} + 1$$

Question 20

Your answer is CORRECT.

Which of these is an equation of one of the asymptotes of the following function?

where $\cos(x) = 0$

$$f(x) = 5 \sec\left(\frac{1}{2}\pi x - \pi\right)$$

$\frac{\pi}{2}x - \pi = \frac{\pi}{2}$

$\frac{\pi}{2}x = \frac{3\pi}{2}$

$x = 3$

a) $x = 4$

b) $x = \frac{3}{4}\pi$

c) $x = 3$

d) $x = 3\pi$

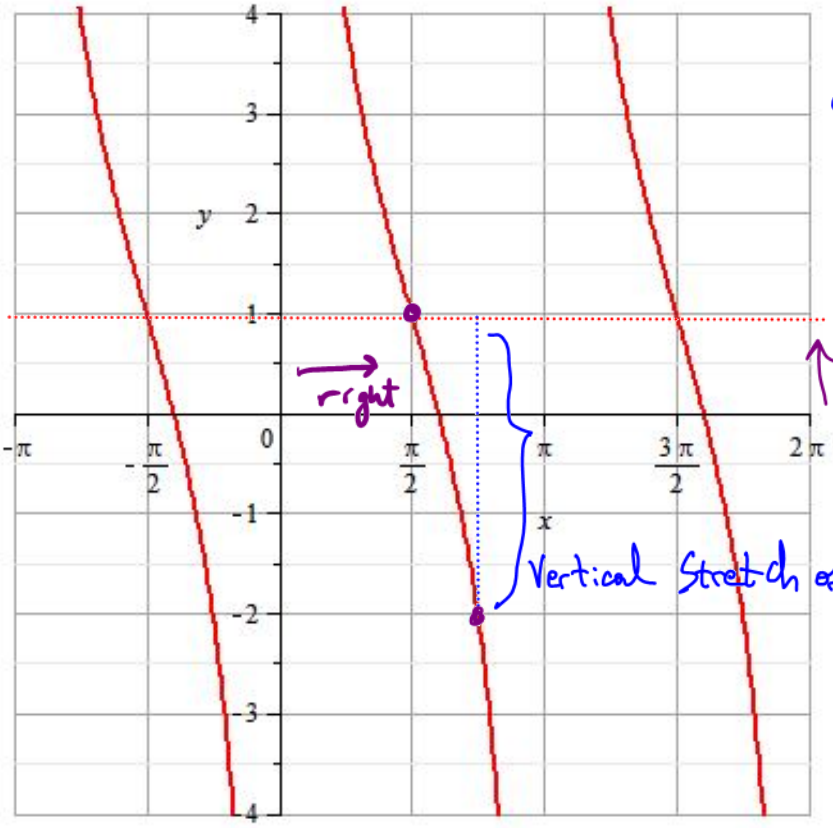
e) $x = \frac{3}{2}$

f) None of the above.

Question 21

Your answer is CORRECT.

Give an equation of the form $f(x) = A \tan(B x - C) + D$ which could be used to represent the given graph. (Note: C or D may be zero.)



• reflect over x-axis

shift up 1 unit. D = 1

Vertical Stretch of factor 3.

$\Rightarrow y = -3\tan\left(x - \frac{\pi}{2}\right) + 1$

a) $f(x) = -3\tan(x)$

b) $f(x) = -3\tan\left(x - \frac{1}{2}\pi\right)$

c) $f(x) = -3\tan(x) - 1$

d) $f(x) = -3\tan\left(x - \frac{1}{2}\pi\right) + 1$

e) $f(x) = -3\tan\left(x - \frac{1}{2}\pi\right) - 1$

f) None of the above.

Question 22

Your answer is CORRECT.

Find: $\cos(-4\pi/3)$ $= \cos(4\pi/3) = -\cos(\pi/3) = -1/2$

a) $1/2$

b) $-\sqrt{3}/2$

c) $\sqrt{3}/2$

d) $\sqrt{2}/2$

e) $-1/2$

f) None of the above.

Question 23

Your answer is CORRECT.

List all x-intercepts for

$$y = -3\sin\left(\frac{1}{2}x + \frac{1}{5}\pi\right)$$

on the interval $[-2\pi/5, 4\pi]$.

$\frac{x}{2} + \frac{\pi}{5} = 0$ $\quad \frac{x}{2} + \frac{\pi}{5} = \pi$

$\frac{x}{2} = -\frac{\pi}{5}$ $\quad \frac{x}{2} = 4\pi/5$

$x = -2\pi/5$ $\quad x = 8\pi/5$

a) $\pi/5,\ 9\pi/5,\ 18\pi/5$

b) -2π/5, 9π/5, 19π/5

c) -2π/5, 8π/5, 4π

d) -2π/5, 8π/5, 18π/5

e) 0, 8π/5, 18π/5

f) None of the above.

$\frac{x}{2} + \frac{\pi}{5} = 2\pi$

$\frac{x}{2} = \frac{9\pi}{5}$

$x = 18\pi/5$

Question 24

Your answer is CORRECT.

Find

$$\cos\left(\sin^{-1}\left(\frac{4}{9}\right)\right)$$

a) $\frac{1}{9}\sqrt{65}$

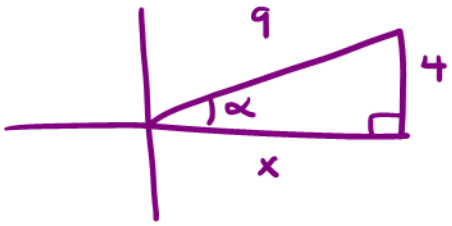
b) $\frac{1}{9}\sqrt{97}$

c) $-\frac{1}{9}\sqrt{65}$

d) $-\frac{4}{9}$

e) $\frac{4}{9}$

f) None of the above.



$x^2 + 4^2 = 9^2$

$x^2 = 81 - 16$

$x^2 = 65$

$x = \sqrt{65}$

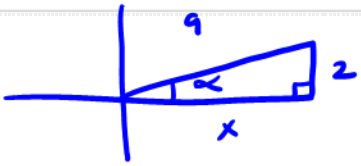
$\cos\alpha = \frac{\sqrt{65}}{9}$

Question 25

Your answer is CORRECT.

Find

$$\tan\left(\sin^{-1}\left(\frac{2}{9}\right)\right)$$



a) $-\frac{2}{77}\sqrt{77}$

$x^2 + 4 = 81$

$x^2 = 77$

$x = \sqrt{77}$

b) $\frac{9}{2}$

$\tan\alpha = \frac{2}{\sqrt{77}} \cdot \frac{\sqrt{77}}{\sqrt{77}} = \frac{2\sqrt{77}}{77}$

c) $\frac{2}{77}$

d) $\frac{2}{77}\sqrt{77}$

e) $\frac{2}{9}$

f) None of the above.