

# PRINTABLE VERSION

## Quiz 9

You scored 100 out of 100

### Question 1

Your answer is CORRECT.

State the "helper" graph that can be used to assist in graphing the following function:

$$f(x) = 9 \sec\left(\frac{1}{3}x\right) + 6$$

a) ☐  $f(x) = 9 \sin\left(\frac{1}{3}x\right) + 6$

Helper graph

b) ☐  $f(x) = 9 \tan\left(\frac{1}{3}x\right) + 6$

$$f(x) = 9 \cos\left(\frac{1}{3}x\right) + 6$$

c) ☒  $f(x) = 9 \cos\left(\frac{1}{3}x\right) + 6$

d) ☐  $f(x) = \frac{9}{2} \sin\left(\frac{1}{3}x\right) + 6$

e) ☐  $f(x) = \frac{9}{2} \csc\left(\frac{1}{3}x\right) + 6$

f) ☐ None of the above.

### Question 2

Your answer is CORRECT.

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

$$f(x) = 7 \sec\left(\frac{1}{6}x\right) + 3$$

→ where  $\cos(x) = 0$

$$\cos(x) = 0$$

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

a) ☐  $x = \frac{3}{4}\pi$

$$\frac{x}{6} \neq \frac{\pi}{2}$$

$$2x = 6\pi$$

$$x = 3\pi$$

$$\frac{x}{6} \neq \frac{3\pi}{2}$$

$$2x = 18\pi$$

$$x = 9\pi$$

b) ☐  $x = 6\pi$

c) ☐  $x = 3$ d) ☒  $x = 3\pi$ e) ☐  $x = \pi$ f) ☐ None of the above.**Question 3****Your answer is CORRECT.**

Find the horizontal shift for the following function:

$$f(x) = 7 \sec \left( \frac{1}{2} \pi x + \frac{1}{4} \pi \right)$$

a) ☐  $\frac{1}{4} \pi$  leftb) ☐ 4 leftc) ☒  $\frac{1}{2}$  leftd) ☐  $\frac{1}{2}$  righte) ☐  $\frac{1}{4} \pi$  rightf) ☐ None of the above.

$$\frac{C}{B} = \frac{-\pi/4}{\pi/2} = -\frac{\pi}{4} \cdot \frac{2}{\pi} = -\frac{2}{4} = -\frac{1}{2}$$

to the left

**Question 4****Your answer is CORRECT.**

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

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

a) ☐  $x = \frac{5}{8} \pi$

b) ☐  $x = \frac{5}{16} \pi$

c) ☐  $x = \frac{15}{4}$

d) ☐  $x = \frac{5}{4} \pi$

e) ☒  $x = \frac{5}{4}$

f) ☐ None of the above.

$$\frac{\pi}{5}x + \frac{\pi}{4} = \frac{\pi}{2}$$

$$\frac{\pi}{5}x = \frac{\pi}{4}$$

$$x = \frac{\pi}{4} \cdot \frac{5}{\pi}$$

$$x = \frac{5}{4}$$

$$\frac{\pi}{5}x + \frac{\pi}{4} = \frac{3\pi}{2}$$

$$\frac{\pi}{5}x = \frac{5\pi}{4}$$

$$x = \frac{5\pi}{4} \cdot \frac{5}{\pi}$$

$$x = \frac{25}{4}$$

**Question 5****Your answer is CORRECT.**

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

$$f(x) = -5 \cot(5x) - 2$$

*where  $\sin(x) = 0$* 

*$\sin(x) = 0$*

*$x = 0, \pi$*

*$5x = 0$*

*$x = 0$*

*$5x = \pi$*

*$x = \frac{\pi}{5}$*

a) ☒  $x = \frac{1}{5} \pi$

b) ☐  $x = \frac{1}{10} \pi$

c) ☐  $x = \frac{1}{10}$

d) ☐  $x = \frac{1}{20}$

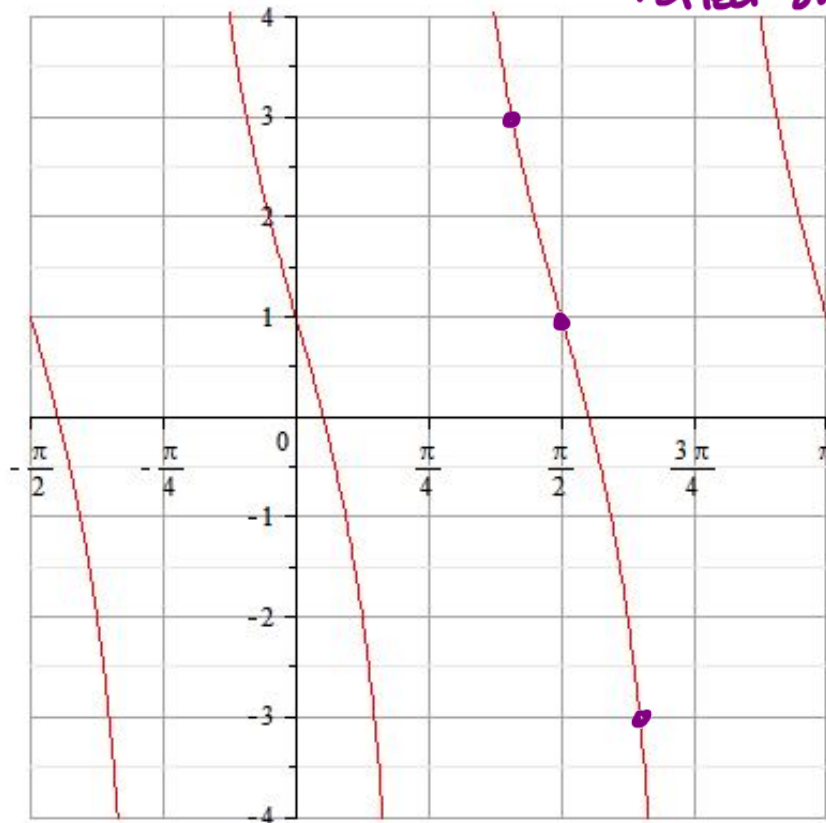
e) ☐  $x = \frac{1}{5}$

f) ☐ None of the above.**Question 6****Your answer is CORRECT.**Give an equation of the form  $f(x) = A \tan(Bx - C) + D$  which could be used to represent the given graph. (Note:  $C$  or  $D$  may be zero.),

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

$$2c = 2\pi$$

$$c = \pi$$



reflect over x-axis

$$A = 3$$

$$D = 1$$

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

$$B\pi = 2\pi$$

$$B = 2$$

$$y = -3 \tan(2x - \pi) + 1$$

- a) ☒  $f(x) = -3 \tan(2x - \pi) + 1$
- b) ☐  $f(x) = -3 \tan(2x - \pi)$
- c) ☐  $f(x) = -3 \tan(2x)$
- d) ☐  $f(x) = -3 \tan(x + 2) + 1$
- e) ☐  $f(x) = -3 \tan(2x - \pi) - 1$
- f) ☐ None of the above.

### Question 7

Your answer is **CORRECT**.

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

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

$$\frac{\pi}{1} \times \frac{2\pi}{B}$$

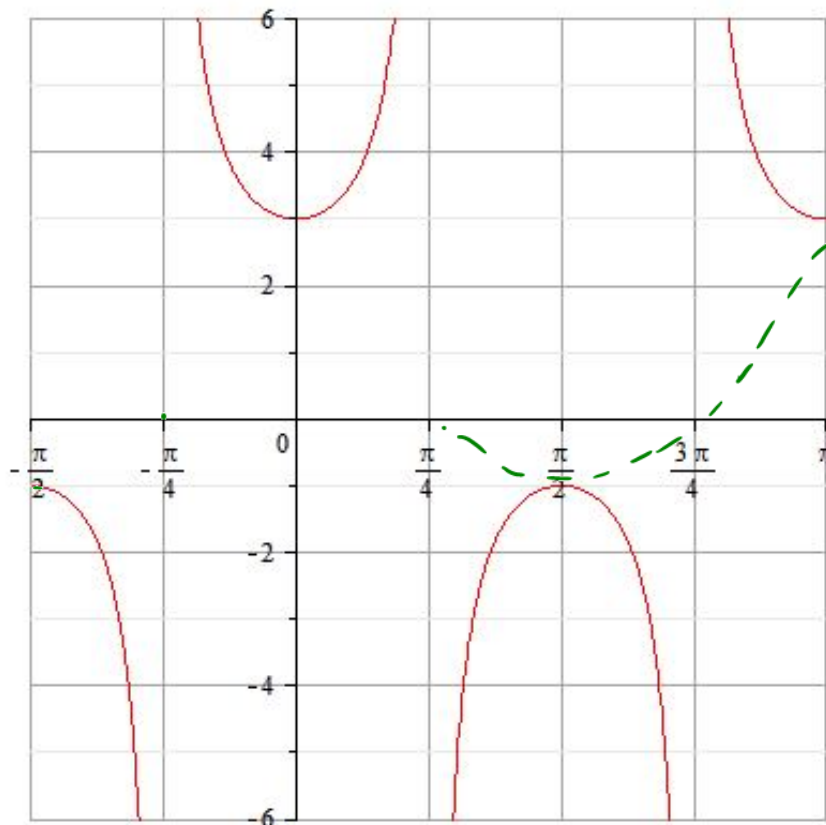
$$B\pi = 2\pi$$

$$B = 2$$

$$\frac{C}{2} \times \frac{\pi}{4}$$

$$4C = 2\pi$$

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



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

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

$$D = \frac{\text{max} + \text{min}}{2}$$

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

a) ☐  $f(x) = -4 \csc \left( 2x - \frac{1}{2}\pi \right) - 1$

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

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

c) ☒  $f(x) = -2 \csc \left( 2x - \frac{1}{2}\pi \right) + 1$

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

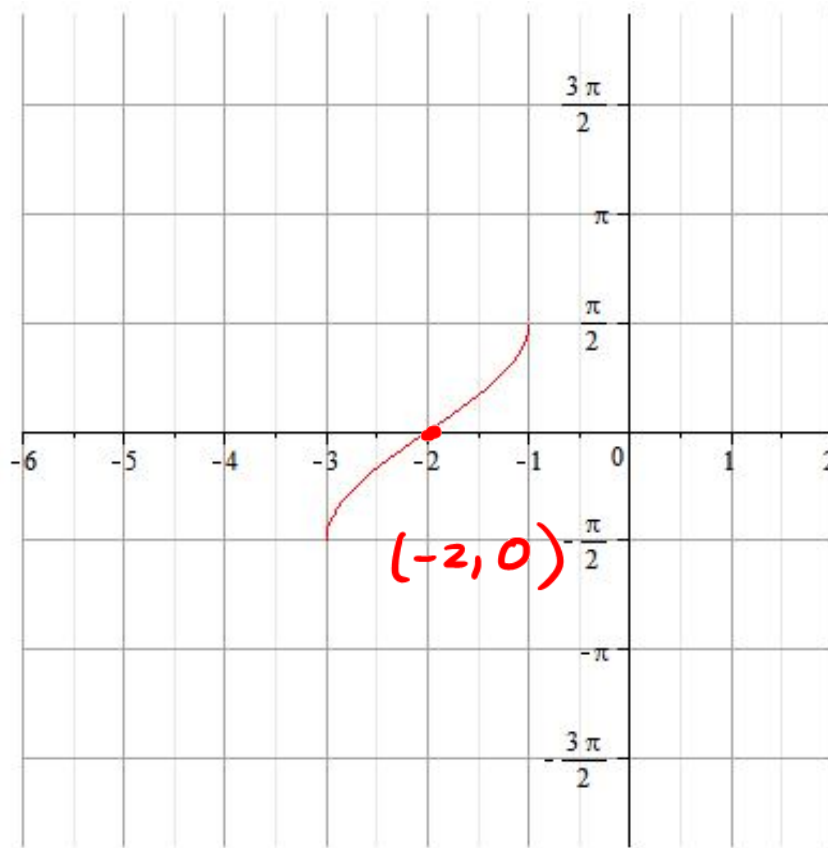
e) ☐  $f(x) = -2 \csc \left( 2x - \frac{1}{2}\pi \right)$

f) ☐ None of the above.

### Question 8

Your answer is CORRECT.

Give an equation which could be used to represent the given graph.



a) ☐  $f(x) = \cos^{-1}(x - 2)$

$$\sin^{-1}(-2+2) = \sin^{-1}(0) = \alpha$$

b) ☒  $f(x) = \sin^{-1}(x + 2)$

$$\sin \alpha = 0$$

$$\alpha = 0$$

c) ☐  $f(x) = \sin^{-1}(x - 2)$

d) ☐  $f(x) = \cos^{-1}(x + 2)$

e) ☐  $f(x) = \tan^{-1}(x + 2)$

f) ☐ None of the above.

### Question 9

Your answer is CORRECT.

Which of these is a point that lies on the graph of the function that is given?

$$y = \arcsin(x + 2) + \pi$$

a) ☐  $(-4, 2\pi)$

$$y = \sin^{-1}(x+2) + \pi$$

$$y = \sin^{-1}(-2+2) + \pi$$

b) ☐  $\left(-2, \frac{3}{2}\pi\right)$

c) ☒  $(-2, \pi)$

d) ☐  $(-2, -\pi)$

e) ☐  $(0, 2\pi)$

f) ☐ None of the above.

$$y = \sin^{-1}(0) + \pi$$

$$(-2, \pi)$$

$$y = 0 + \pi = \pi$$

**Question 10**

Your answer is CORRECT.

Which of these is a point that lies on the graph of the function that is given?

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

a) ☐  $\left(\frac{3}{2}\pi, -2\right)$

b) ☐  $\left(\frac{3}{2}\pi, -3\right)$

c) ☒  $\left(\frac{3}{2}\pi, -4\right)$

d) ☐  $\left(\frac{3}{2}\pi, \sqrt{2} - 3\right)$

e) ☐  $\left(\frac{3}{2}\pi, 0\right)$

f) ☐ None of the above.

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

$$y = \tan\left(\frac{3}{4}\pi\right) - 3$$

$$y = -1 - 3 = -4$$

**Question 11**

Your answer is CORRECT.

Find the exact value of the following expression. Do not use a calculator. If undefined, state, *undefined*.

$$\sin\left(\cos^{-1}\left(\frac{7}{25}\right)\right)$$

a) ☒  $\frac{24}{25}$

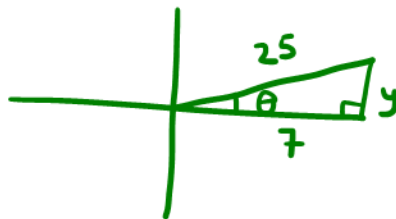
b) ☐  $\frac{25}{24}$

c) ☐  $\frac{24}{7}$

d) ☐ undefined

e) ☐  $\frac{7}{24}$

f) ☐ None of the above.



$$7^2 + y^2 = 25^2$$

$$y^2 = 576$$

$$y = 24$$

$$\sin \theta = \frac{24}{25}$$

### Question 12

Your answer is CORRECT.

Find the exact value of the following expression. Do not use a calculator. If undefined, state, *undefined*.

$$\sin \left( \tan^{-1} \left( \frac{15}{8} \right) \right)$$

a) ☐  $\frac{15}{8}$

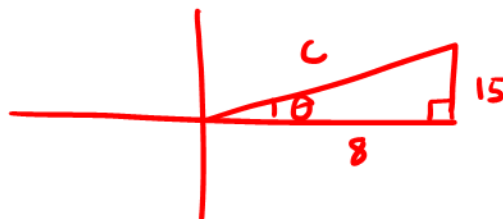
b) ☐  $\frac{17}{15}$

c) ☐ undefined

d) ☒  $\frac{15}{17}$

e) ☐  $\frac{8}{15}$

f) ☐ None of the above.



$$c^2 = 15^2 + 8^2$$

$$c^2 = 289$$

$$c = 17$$

$$\sin \theta = \frac{15}{17}$$

### Question 13

Your answer is CORRECT.

The current  $I$ , in amperes, flowing through an ac (alternating current) circuit at time  $t$  is

$$I = 200 \sin(40\pi t), \text{ where } t \geq 0$$



What is the period?

a) ☐  $40\pi$

b) ☐ 200

c) ☒  $\frac{1}{20}$

d) ☐  $\frac{1}{20\pi}$

e) ☐  $\frac{1}{40}$

f) ☐ None of the above.

$$\text{Period} = \frac{2\pi}{B} = \frac{2\pi}{40\pi} = \frac{1}{20}$$

#### Question 14

Your answer is CORRECT.

The current  $I$ , in amperes, flowing through an ac (alternating current) circuit at time  $t$  is

$$I = 240 \sin(35\pi t + \pi/3), \text{ where } t \geq 0$$

What is the horizontal shift?

a) ☐ 240 units up

b) ☐  $\frac{1}{105}$  units down

c) ☒  $\frac{1}{105}$  units to the left

d) ☐  $\frac{1}{105}$  units to the right

e) ☐ 240 units down

f) ☐ None of the above.

$$\text{Phase Shift} = \frac{C}{B} = \frac{-\frac{\pi}{3}}{35\pi}$$

$$= -\frac{\pi}{3} \cdot \frac{1}{35\pi} = -\frac{1}{105}$$

↑  
units to the left

#### Question 15

Your answer is CORRECT.

The electromotive force  $E$ , in volts, in a certain ac (alternating current) circuit at time  $t$  obeys the equation

$$E = 120 \sin(140\pi t), \text{ where } t \geq 0$$

What is the maximum value of  $E$ ?

↓ Amplitude

- a) ☒ 120
- b) ☐  $16800\pi$
- c) ☐ 60
- d) ☐  $70\pi$
- e) ☐  $140\pi$
- f) ☐ None of the above.

**Question 16**

Your answer is CORRECT.

Determine the period of the function

$$y = 2 \tan(4\pi x - 5)$$

- a) ☐  $2\pi$
- b) ☐  $4\pi^2$
- c) ☐  $\frac{1}{8}$
- d) ☒  $\frac{1}{4}$
- e) ☐  $\pi$
- f) ☐ None of the above.

$$\text{Period} = \frac{\pi}{B} = \frac{\pi}{4\pi} = \frac{1}{4}$$

**Question 17**

Your answer is CORRECT.

Determine the period of the function

$$y = 2 \sec(4x - 5)$$

- a) ☒  $\frac{1}{2}\pi$
- b) ☐  $\frac{1}{8}\pi$

$$\text{Period} = \frac{2\pi}{B} = \frac{2\pi}{4} = \frac{\pi}{2}$$

- c) ☐  $4\pi$
- d) ☐  $\frac{1}{4}\pi$
- e) ☐  $2\pi$
- f) ☐ None of the above.

### Question 18

Your answer is CORRECT.

Evaluate the exact value of

$$\cos(\arctan(\sqrt{14}))$$

a) ☐  $\frac{1}{13}\sqrt{13}$

☒  $\frac{1}{15}\sqrt{15}$

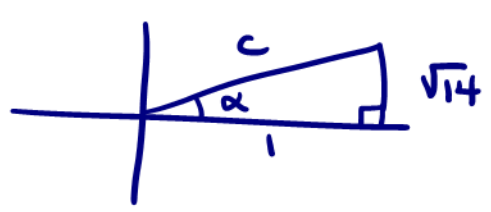
c) ☐  $\frac{1}{196}$

d) ☐  $\frac{1}{14}$

e) ☐  $\frac{1}{14}\sqrt{14}$

- f) ☐ None of the above.

$\tan \alpha = \frac{\sqrt{14}}{1}$



$c^2 = 14 + 1$   
 $c^2 = 15$   
 $c = \sqrt{15}$

$\cos \alpha = \frac{1}{\sqrt{15}} \cdot \frac{\sqrt{15}}{\sqrt{15}} = \frac{\sqrt{15}}{15}$

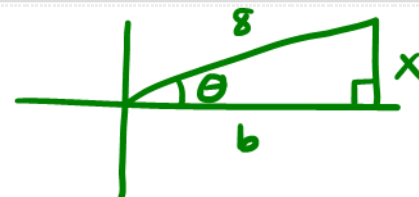
### Question 19

Your answer is CORRECT.

Simplify

$\sin \theta = \frac{x}{8}$

$\cos\left(\arcsin\left(\frac{1}{8}x\right)\right)$



where  $-1 \leq \frac{1}{8}x \leq 1$ .

a) ☐  $\frac{8}{\sqrt{64-x^2}}$

$b^2 + x^2 = 8^2$

$b^2 = 64 - x^2$

$b = \sqrt{64 - x^2}$

b) ☐  $\frac{1}{8} \sqrt{64 + x^2}$

c) ☒  $\frac{1}{8} \sqrt{64 - x^2}$

d) ☐  $\frac{\sqrt{64 - x^2}}{(2\sqrt{2})}$

e) ☐  $\frac{8}{\sqrt{-64 + x^2}}$

f) ☐ None of the above.

$$\cos \theta = \frac{\sqrt{64 - x^2}}{8}$$

### Question 20

Your answer is CORRECT.

Simplify

$$\sec \left( \arctan \left( \frac{1}{8} x \right) \right)$$

where  $x > 0$ .

$$\tan \alpha = \frac{x}{8}$$

a) ☐  $\frac{8}{\sqrt{64 - x^2}}$

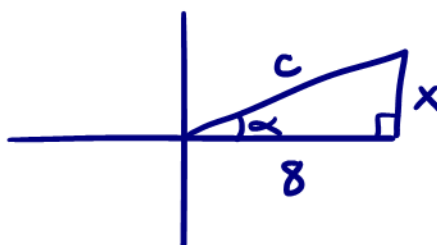
b) ☐  $\frac{1}{8} \sqrt{-64 + x^2}$

c) ☒  $\frac{1}{8} \sqrt{64 + x^2}$

d) ☐  $\frac{\sqrt{64 - x^2}}{(2\sqrt{2})}$

e) ☐  $\frac{8}{\sqrt{-64 + x^2}}$

f) ☐ None of the above.



$$\sec \alpha = \frac{\sqrt{x^2 + 64}}{8}$$

$$c^2 = x^2 + 8^2$$

$$c^2 = x^2 + 64$$

$$c = \sqrt{x^2 + 64}$$

### Question 21

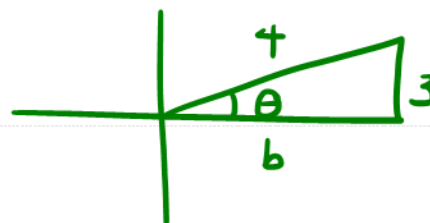
Your answer is CORRECT.

Evaluate

$$\tan(\sin^{-1}(\frac{3}{4}))$$

$$\downarrow$$

$$\sin \theta = \frac{3}{4}$$



$$b^2 + 3^2 = 4^2$$

$$b^2 = 16 - 9$$

$$b^2 = 7$$

$$b = \sqrt{7}$$

$$\tan \theta = \frac{3}{\sqrt{7}} = \frac{3\sqrt{7}}{7}$$

a) ☐  $\frac{3}{5}$

b) ☒  $\frac{3}{7}\sqrt{7}$

c) ☐  $\frac{35}{36}$

d) ☐  $\frac{6}{7}$

e) ☐  $\frac{1}{36}$

f) ☐ None of the above.

Question 22

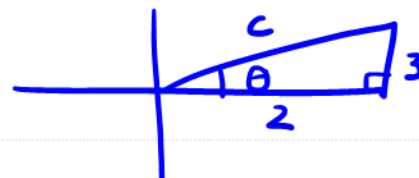
Your answer is CORRECT.

Evaluate

$$\cos(\tan^{-1}(\frac{3}{2}))$$

$$\downarrow$$

$$\tan \theta = \frac{3}{2}$$



$$c^2 = 3^2 + 2^2$$

$$c^2 = 9 + 4$$

$$c^2 = 13$$

$$c = \sqrt{13}$$

$$\cos \theta = \frac{2}{\sqrt{13}} = \frac{2\sqrt{13}}{13}$$

a) ☐  $3\sqrt{13}$

b) ☐  $\frac{3}{5}\sqrt{5}$

c) ☐  $\frac{2}{5}\sqrt{5}$

d) ☐  $\frac{3}{13}\sqrt{13}$

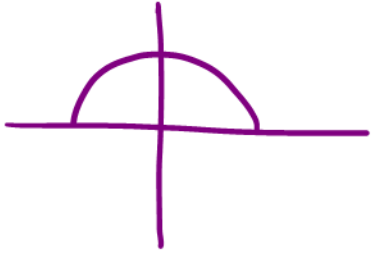
e) ☒  $\frac{2}{13}\sqrt{13}$

f) ☐ None of the above.

### Question 23

Your answer is CORRECT.

Evaluate:  $\arccos(\cos(\frac{11\pi}{6})) = \arccos(\frac{\sqrt{3}}{2}) = \frac{\pi}{6}$



a) ☐  $\frac{5}{6}\pi$

b) ☐  $\frac{11}{6}\pi$

c) ☐  $\frac{1}{2}\sqrt{3}$

d) ☐  $-\frac{1}{2}$

**e) ☒  $\frac{1}{6}\pi$**

f) ☐ None of the above.

### Question 24

Your answer is CORRECT.

Evaluate:  $\arcsin(\sin(\frac{\pi}{3})) = \arcsin(\frac{\sqrt{3}}{2}) = \frac{\pi}{3}$

a) ☐  $\frac{1}{2}\sqrt{3}$

**b) ☒  $\frac{1}{3}\pi$**

c) ☐  $\frac{2}{3}\pi$

d) ☐  $-\frac{2}{3}\pi$

e) ☐  $\frac{1}{2}$

f) ☐ None of the above.

### Question 25

Your answer is CORRECT.

Evaluate:  $\arctan(\tan(\pi/6)) = \arctan(\frac{\sqrt{3}}{3}) = \pi/6$

a) ☐  $\frac{1}{2}\sqrt{3}$

b) ☐  $\frac{5}{6}\pi$

c) ☒  $\frac{1}{6}\pi$

d) ☐  $-\frac{5}{6}\pi$

e) ☐  $\frac{1}{2}$

f) ☐ None of the above.

$$\tan(\pi/6) = \frac{\sin(\pi/6)}{\cos(\pi/6)} = \frac{1/2}{\sqrt{3}/2} = \frac{1}{2} \cdot \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$