

4.20 Trig Inverse and Principal Values Quiz Review WS #2

key

Find the exact value for each expression. Use radian measures for angles. Use principal values for inverses.

1.  $\text{Arcsin}(-1)$  Q4

$$\sin \theta = -1$$

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

2.  $\text{Cos}^{-1}\left(-\frac{\sqrt{2}}{2}\right)$  Q2

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

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

3.  $\text{Tan}^{-1}\left(-\frac{1}{\sqrt{3}}\right)$  Q4

$$\tan \theta = -\frac{1}{\sqrt{3}}$$

$$\theta = -\frac{\pi}{6}$$

4.  $\text{Cos}^{-1}\left(\frac{\sqrt{3}}{2}\right)$  Q1

$$\cos \theta = \frac{\sqrt{3}}{2}$$

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

5.  $\sin[\text{Tan}^{-1}(-\sqrt{3})]$

$$\downarrow$$

$$\tan \theta = -\frac{\sqrt{3}}{1}$$

$$\downarrow$$

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

6.  $\text{Arccos}\left[\sin\left(\frac{5\pi}{3}\right)\right]$

$$\downarrow$$

$$\text{Arccos}\left(-\frac{\sqrt{3}}{2}\right)$$

$$\cos \theta = -\frac{\sqrt{3}}{2} \quad \leftarrow \text{Q2}$$

$$\theta = \frac{5\pi}{6}$$

7.  $\text{Sin}^{-1}\left[\tan\left(\frac{3\pi}{4}\right)\right]$

$$\downarrow$$

$$\text{Sin}^{-1}(-1)$$

$$\sin \theta = -1$$

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

8.  $\cot[\text{Cos}^{-1}\left(\frac{\sqrt{3}}{2}\right)]$

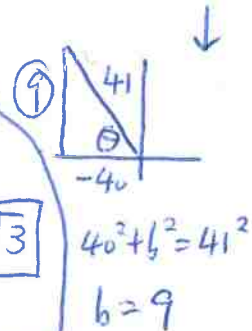
$$\downarrow$$

$$\cos \theta = \frac{\sqrt{3}}{2}$$

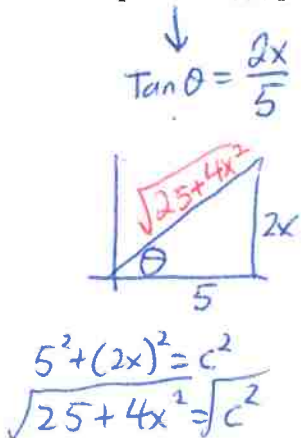
$$\downarrow$$

$$\cot\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{1} = \sqrt{3}$$

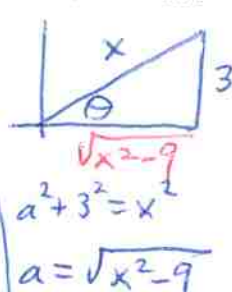
9.  $\tan[\text{Arccos}\left(-\frac{40}{41}\right)] = \frac{9}{-40}$



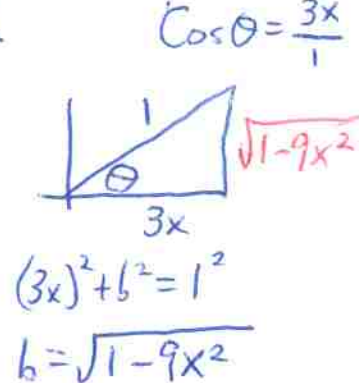
10.  $\cos[\text{Arctan}\left(\frac{2x}{5}\right)]$



11.  $\cot[\text{Sin}^{-1}\left(\frac{3}{x}\right)] \rightarrow \frac{\sqrt{x^2-9}}{3}$



12.  $\csc[\text{Cos}^{-1}(3x)] \rightarrow \frac{1}{\sqrt{1-9x^2}}$

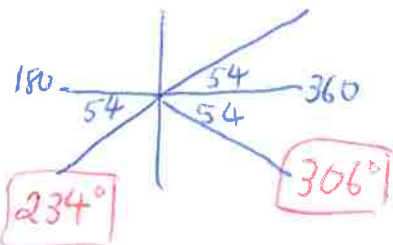


Use a calculator to find two values of  $\theta$ , where  $0^\circ \leq \theta < 360^\circ$ . Round to the nearest degree.

13.  $\arcsin(-0.8121)$

$\sin \theta = -0.8121$

$\theta = 54^\circ$



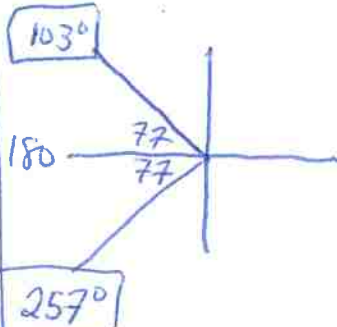
$\theta = 234^\circ$  and  $306^\circ$

Q3, Q4

14.  $\cos^{-1}(-0.2211)$

$\cos \theta = -0.2211$

$\theta = 102.77 \rightarrow 103^\circ$

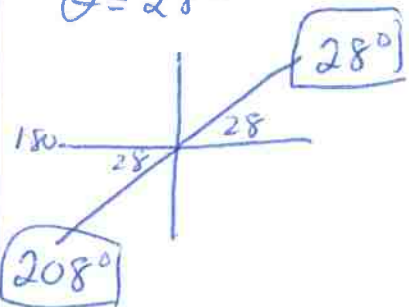


$\theta = 103^\circ$  and  $257^\circ$

Q2  
Q3

15.  $\tan \theta = 0.5249$

$\theta = 28^\circ$



$\theta = 28^\circ$  and  $208^\circ$

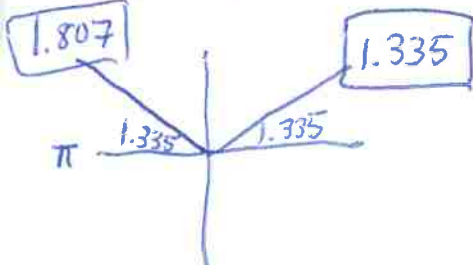
Q1  
Q3

Use a calculator to find two values of  $\theta$ , where  $0 \leq \theta < 2\pi$ . Round to the nearest thousandth of a radian.

16.  $\arcsin(0.9723)$

$\sin \theta = 0.9723$

$\theta = 1.335$



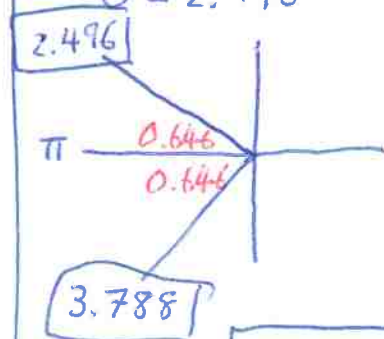
$\theta = 1.335, 1.807$

Q1, Q2

17.  $\cos^{-1}(-0.7989)$

$\cos \theta = -0.7989$

$\theta = 2.496$

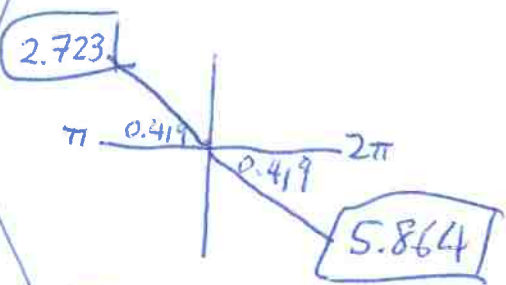


$\theta = 2.496, 3.788$

Q2, Q3

18.  $\tan \theta = -0.4451$

$\theta = -0.419$

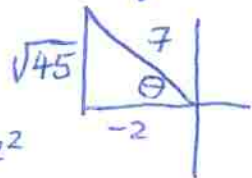


$\theta = 2.723, 5.864$

Q2, Q4

19)  $\tan[\arccos(-\frac{2}{7})]$

$\cos \theta = -\frac{2}{7}$

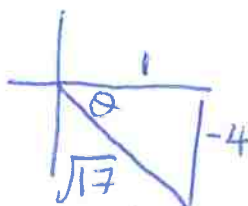


$a^2 + 2^2 = 7^2$   
 $a = \sqrt{45}$

$\frac{\sqrt{45}}{-2}$  or  $\frac{3\sqrt{5}}{-2}$

20)  $\sin[\arctan(-4)]$

$\tan \theta = -\frac{4}{1}$



$1^2 + 4^2 = c^2$

$\frac{-4}{\sqrt{17}}$