

Key

4.20 Trig Inverse and Principal Values Quiz Review WS 1

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

1.  $\text{Arctan}(-1)$  Q4  
 $\tan \theta = -1$   
 $\theta = -\pi/4$

2.  $\text{Cos}^{-1}(-1)$  Q2  
 $\cos \theta = -1$   
 $\theta = \pi$

3.  $\text{Sin}^{-1}(-\frac{1}{2})$  Q4  
 $\sin \theta = -\frac{1}{2}$   
 $\theta = -\pi/6$

4.  $\text{Tan}^{-1}(\sqrt{3})$  Q1  
 $\tan \theta = \frac{\sqrt{3}}{1}$   
 $\theta = \frac{\pi}{3}$

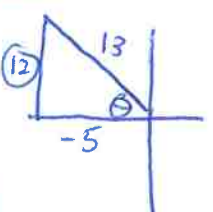
5.  $\cos[\text{Tan}^{-1}(-\sqrt{3})]$  Q4  
 $\downarrow$   
 $\tan \theta = -\frac{\sqrt{3}}{1}$   
 $\theta = -\pi/3$   
 $\cos(-\pi/3) = \frac{1}{2}$

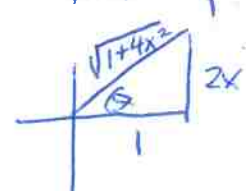
6.  $\text{Arccos}[\sin(\frac{2\pi}{3})]$   
 $\downarrow$   
 $\sin(\frac{2\pi}{3}) = \frac{\sqrt{3}}{2}$   
 $\text{Arccos}(\frac{\sqrt{3}}{2})$   
 $\downarrow$   
 $\cos \theta = \frac{\sqrt{3}}{2}$  Q1  
 $\theta = \pi/6$

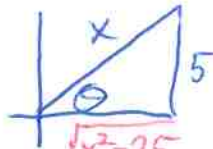
7.  $\text{Sin}^{-1}[\tan(\frac{7\pi}{4})]$  Q4  
 $\downarrow$   
 $\sin^{-1}(-1)$   
 $\sin \theta = -1$   
 $\theta = -\pi/2$

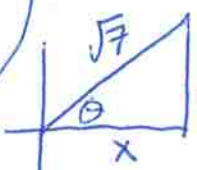
8.  $\cot[2\text{Sin}^{-1}(\frac{\sqrt{3}}{2})]$   
 $\downarrow$   
 $\sin \theta = \frac{\sqrt{3}}{2}$   
 $\theta = \frac{\pi}{3}$   
 $\cot[2 \cdot \frac{\pi}{3}]$   
 $\cot(\frac{2\pi}{3}) = \frac{-1}{\sqrt{3}} \text{ or } \frac{-\sqrt{3}}{3}$

9.  $\cot[\text{Arccos}(-\frac{5}{13})]$   
 $\cos \theta = -\frac{5}{13}$   
 $\cot \theta = \frac{-5}{12}$



10.  $\cos[\text{Arctan}(2x)] = \frac{1}{\sqrt{1+4x^2}}$   
 $\downarrow$   
 $\tan \theta = \frac{2x}{1}$   
  
 $1^2 + (2x)^2 = c^2$   
 $1 + 4x^2 = c^2$   
 $c = \sqrt{1+4x^2}$

11.  $\tan[\text{Sin}^{-1}(\frac{5}{x})] = \frac{5}{\sqrt{x^2-25}}$   
 $\downarrow$   
 $\sin \theta = \frac{5}{x}$   
  
 $a^2 + 5^2 = x^2$   
 $a^2 = x^2 - 25$   
 $a = \sqrt{x^2 - 25}$

12.  $\csc[\text{Cos}^{-1}(\frac{x}{\sqrt{7}})] = \frac{\sqrt{7}}{\sqrt{7-x^2}}$   
 $\downarrow$   
 $\cos \theta = \frac{x}{\sqrt{7}}$   
  
 $x^2 + b^2 = \sqrt{7}^2$   
 $b^2 = 7 - x^2$   
 $b = \sqrt{7-x^2}$

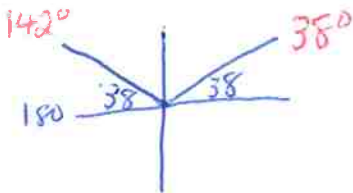
Use a calculator to find two values of  $\theta$ , where  $0^\circ \leq \theta < 360^\circ$ . Round to the nearest degree.



13.  $\arcsin(0.6191)$

Q1, Q2

$\sin \theta = 0.6191$   $\theta = 38^\circ$



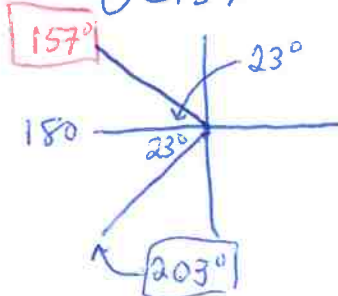
$\theta = 38^\circ$  and  $142^\circ$

14.  $\cos^{-1}(-0.9211)$

Q2, Q3

$\cos \theta = -0.9211$

$\theta = 157^\circ$



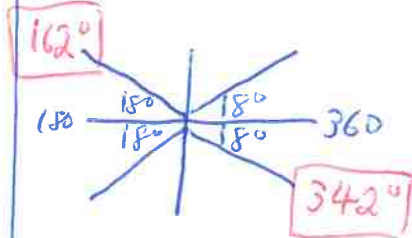
$\theta = 157^\circ$  and  $203^\circ$

15.  $\tan \theta = -0.3249$

Q2, Q4

$\theta = \tan^{-1}(-0.3249)$

$\theta = -18^\circ$



$\theta = 162^\circ$  and  $342^\circ$

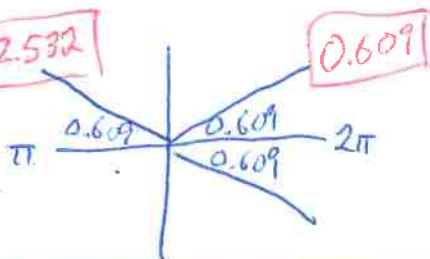
Use a calculator to find two values of  $\theta$ , where  $0 \leq \theta < 2\pi$ . Round to the nearest thousandth of a radian.

16.  $\arcsin(0.5723)$

Q1, Q2

$\sin \theta = 0.5723$

$\theta = 0.6093$



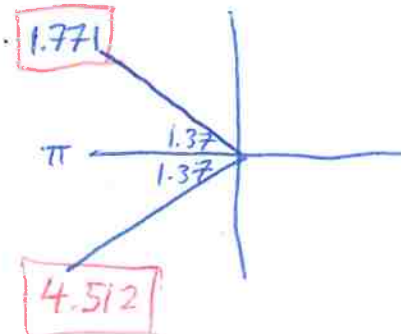
$\theta = 0.609$  and  $2.532$

17.  $\cos^{-1}(-0.1989)$

Q2, Q3

$\cos \theta = -0.1989$

$\theta = 1.771$



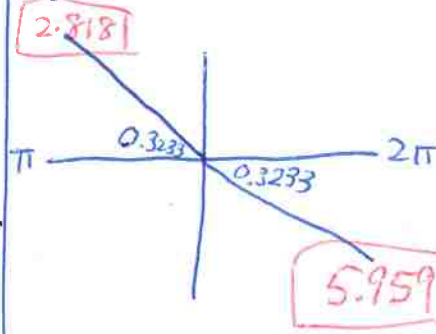
$\theta = 1.771$  and  $4.512$

18.  $\tan \theta = -0.3351$

Q2, Q4

$\theta = \tan^{-1}(-0.3351)$

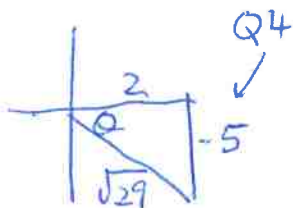
$\theta = -0.3233$



$\theta = 2.818$  and  $5.959$

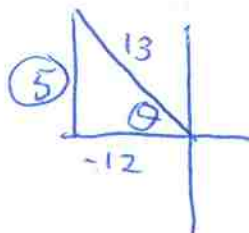
19)  $\cos \left[ \tan^{-1} \left( -\frac{5}{2} \right) \right] \rightarrow \frac{2}{\sqrt{29}}$

$\tan \theta = -\frac{5}{2}$



$2^2 + 5^2 = c^2$   $c = 29$

20)  $\tan \left[ \cos^{-1} \left( -\frac{12}{13} \right) \right] = \frac{5}{-12}$



$\cos \theta = -\frac{12}{13}$