4.6-4.7 Review *Non-calculator*

Key

If possible, find the exact value in radians. Be sure to consider the domain and range restrictions.

1. $\arccos(0)$ $\frac{\pi}{2}$	2. $\sin^{-1}(0)$ 0	3. $\arctan(0)$ 0	4. $\tan^{-1}\left(\sqrt{3}\right)$ $\frac{\pi}{3}$
5. $\cos^{-1}\left(\frac{\sqrt{2}}{2}\right)$ $\frac{\pi}{4}$	6. $\arccos\left(-\frac{\sqrt{2}}{2}\right)$ $\frac{3\pi}{4}$	7. $\sin^{-1}(-4)$ undefined	8. $\arcsin\left(-\frac{\sqrt{3}}{2}\right)$ $-\frac{\pi}{3}$
9. $\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)$ $-\frac{\pi}{6}$	10. $\cos^{-1}\left(-\frac{1}{2}\right)$ $\frac{2\pi}{3}$	11. $\arcsin\left(-\frac{\sqrt{2}}{2}\right)$ $-\frac{\pi}{4}$	12. $\tan^{-1}(-1)$ $-\frac{\pi}{4}$

If possible, find the exact value. Be sure to consider the domain and range.

(7) 13. $\sin(\arcsin 7)$

↑ not in the domain of $\sin^{-1}x$

undefined

(8) 14. $\cos^{-1}\left(\cos\frac{5\pi}{4}\right)$

$\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

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

(9) 15. $\tan\left[\arctan(7)\right]$

$\tan^{-1}x$ domain is $(-\infty, \infty)$

7

(10) 16. $\arcsin\left[\cos\left(\frac{\pi}{3}\right)\right]$

$\arcsin\left(\frac{1}{2}\right)$

$\frac{\pi}{6}$

(11) 17. $\arccos(\tan 5\pi)$

$\arccos(0)$

$\frac{\pi}{2}$

(12) 18. $\arccos\left(\sin\left(-\frac{5\pi}{2}\right)\right)$

$\arccos(-1)$

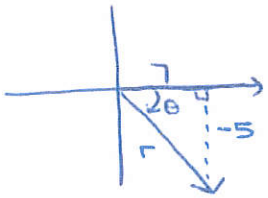
π

Evaluate. *(Make a sketch of a right triangle.)*

(16) 19. $\cos\left[\arctan\left(-\frac{5}{7}\right)\right]$

θ

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



$\cos(\theta)$

$= \frac{7}{\sqrt{74}}$

$= \frac{7\sqrt{74}}{74}$

$r^2 = (7)^2 + (-5)^2$

$r^2 = 49 + 25$

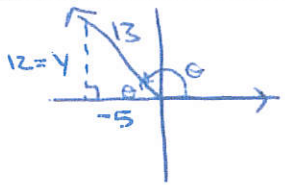
$r^2 = 74$

$r = \sqrt{74}$

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

θ

$[0, \pi]$



$\tan(\theta)$

$= -\frac{12}{5}$

$y^2 + 25 = 169$

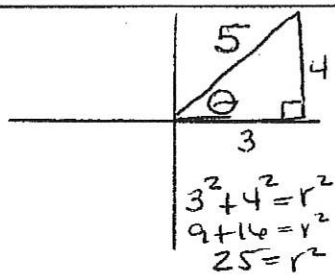
$y^2 = 144$

$y = \pm 12$

$y = 12$

Evaluate using the composition of functions. Consider the quadrant and draw a right triangle. Find the missing side and solve.

14. $\sin\left(\arctan\frac{4}{3}\right)$

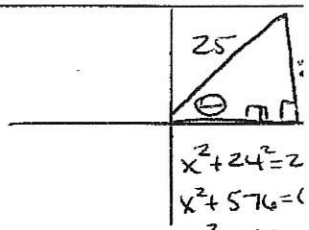


$3^2+4^2=r^2$
$9+16=r^2$
$25=r^2$
$\pm 5=r$
$5=r$

arctan 4/3
Quad I or IV

$\sin\theta = \frac{4}{5}$

15. $\cos\left(\arcsin\frac{24}{25}\right)$

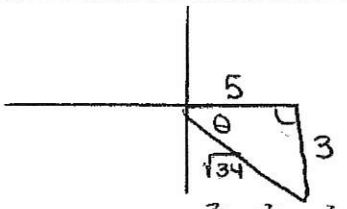


$x^2+24^2=2$
$x^2+576=($
$x^2=49$
$x=\pm 7$
$x=7$

$\arcsin\left(\frac{24}{25}\right)$
Quad I or IV

$\cos\theta = \frac{7}{25}$

16. $\sec\left(\tan^{-1}-\frac{3}{5}\right)$



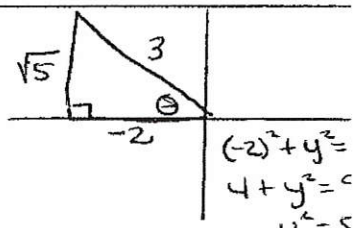
$3^2+5^2=r^2$
$9+25=r^2$
$34=r^2$
$\pm\sqrt{34}=r$
$\sqrt{34}=r$

$\tan^{-1}(3/5)$
Quad I or IV

$\cos\theta = \frac{5}{\sqrt{34}}$

$\sec\theta = \frac{\sqrt{34}}{5}$

17. $\sin\left(\cos^{-1}-\frac{2}{3}\right)$



$(-2)^2+y^2=$
$4+y^2=$
$y^2=5$
$y=\pm$
$y=$

$\cos^{-1}(-2/3)$
Quad I or II

$\sin\theta = \frac{\sqrt{5}}{3}$

CHALLENGE!!

Write each equation in the form of an inverse relation.

For example: $n=\sin\theta$ becomes ... $\sin^{-1}n=\theta$. Solve for θ without a calculator.

18. $\frac{1}{2}=\cos\theta$

$\cos^{-1}\left(\frac{1}{2}\right)=\theta$

$\theta = \pi/3$

19. $-\sqrt{3}=\tan A$

$\tan^{-1}(-\sqrt{3})=A$

$A=-\pi/3$

20. $0=\sec\theta$

?

$\sec^{-1}0=\theta$

$\frac{1}{\cos(0)}=\theta$

$\pi/2=\theta$