13-9 Inverse Trigonometric Functions HOMEWORK

Name _____
Date _____ Block _____

Example: Find $\text{Cos}^{-1}\left(-\frac{\sqrt{3}}{2}\right)$.

Let $\theta = \text{Cos}^{-1}\left(-\frac{\sqrt{3}}{2}\right)$.

For which angle in the restricted area is the $\cos\left(-\frac{\sqrt{3}}{2}\right)$=?

Then, $\text{Cos}\,\theta = -\frac{\sqrt{3}}{2}$ . . . Therefore, $\boxed{\text{Cos}^{-1}\left(-\frac{\sqrt{3}}{2}\right) = 150°}$

Evaluate the following on your calculator in degree mode.

1. $\cos^{-1}(0.7) =$ 45.6°
2. $\sin^{-1}(0.26) =$ 15.1°
3. $\tan^{-1}(3.5) =$ 74.1°
4. $\cos^{-1}(-0.7) =$ 134.4°
5. $\sin^{-1}(-0.26) =$ −15.1°
6. $\tan^{-1}(-3.5) =$ −74.1°

How does the 2nd row compare with the first row? Why?

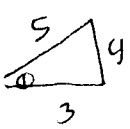
1 & 4 supp 2 & 5 opp. ∠s 3 & 6 opp. ∠s

Evaluate the following without a calculator.

7. $\text{Cos}^{-1}\left(\frac{1}{2}\right)$ 60°
8. $\text{Sin}^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ −60°
9. $\text{Tan}^{-1}(0)$ 0°
10. $\cot(\text{Tan}^{-1}\ 2)$ $\frac{1}{2}$
11. $\text{Arctan}(-1)$ −45°
12. $\text{Cot}^{-1}\ 1$ 45°
13. $\cos\left(\text{Sin}^{-1}-\frac{\sqrt{2}}{2}\right)$ $\cos(-45°)$ $\frac{\sqrt{2}}{2}$
14. $\text{Sin}^{-1}\left(\frac{\sqrt{3}}{2}\right)$ 60°
15. $\sin\left(\text{Arcsin}\ \frac{\sqrt{3}}{2}\right)$ $\frac{\sqrt{3}}{2}$
16. $\text{Arccos}\left(-\frac{\sqrt{3}}{2}\right)$ 150°
17. $\text{Arcsin}\left(\frac{\sqrt{2}}{2}\right)$ 45°
18. $\text{Arccot}\left(-\frac{\sqrt{3}}{3}\right)$ −60° Arctan $(-\sqrt{3})$

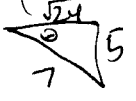
Find the exact value of the expression (hint: sketch a right triangle).

19. $\cos(\sin^{-1}\frac{4}{5})$ $\frac{3}{5}$

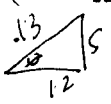


20. $\tan(\cos^{-1}\frac{2}{3})$ $\frac{\sqrt{5}}{2}$

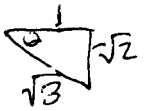
21. $\tan\left(\text{Arcsin}\ -\frac{5}{7}\right)$ $-\frac{5\sqrt{6}}{12}$



22. $\sin\left(\text{Tan}^{-1}\frac{5}{12}\right)$ $\frac{5}{13}$



23. $\sin[\text{Arctan}(-\sqrt{2})]$ $-\frac{\sqrt{2}}{\sqrt{3}}$ $-\frac{\sqrt{6}}{3}$



24. $\csc\left(\text{Arcsin}\ \frac{11}{15}\right)$ $\frac{15}{11}$

Evaluate the following without a calculator.

1. $\text{Cos}^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ 150°

2. $\text{Sin}^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ $-45°$

3. $\text{Arctan}\left(-\frac{\sqrt{3}}{3}\right)$ $-30°$

4. Arccos 1 $0°$

5. $\sin\left(\text{Sin}^{-1}\frac{3}{8}\right)$ $\frac{3}{8}$

6. $\cos\left(\text{Sin}^{-1}-\frac{3}{5}\right)$ $\frac{4}{5}$

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

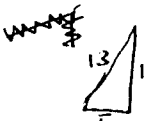
$\tan 150 \quad \frac{\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = \frac{1}{-\sqrt{3}}$

8. $\sec\left(\text{Cos}^{-1}\frac{2}{9}\right)$ $\frac{9}{2}$

9. csc (Arctan -1)

$\frac{1}{-\frac{\sqrt{2}}{2}} = -\frac{2}{\sqrt{2}} = -\sqrt{2}$

10. $\cot\left(\text{Arcsin}\frac{12}{13}\right)$



$\cot\theta = \frac{\text{Adj}}{\text{Opp}} = \frac{5}{12}$

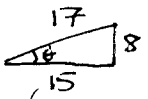
11. $\text{Sin}^{-1}\left(\cos\frac{\pi}{3}\right)$

$\sin^{-1}\left(\frac{1}{2}\right) = 30°$

12. $\text{Cos}^{-1}\left(\tan\frac{3}{4}\pi\right)$

$\cos^{-1}(-1) = 180°$

13. $\sin\left(\text{Cos}^{-1}\frac{15}{17}\right)$



$\frac{8}{17}$

14. $\cos\left(\text{Sin}^{-1}\frac{\sqrt{3}}{2}\right)$

$\cos 60° = \frac{1}{2}$

15. $\sin\left(\text{Arctan}\frac{\sqrt{3}}{3}\right)$

$\sin 30° = \frac{1}{2}$

16. $\text{Sin}^{-1}(\tan 45°)$

$\sin^{-1}(1) = 90°$

17. $\text{Cos}^{-1}\left(\sin\frac{\pi}{6}\right)$

$\cos^{-1}\left(\frac{1}{2}\right) = 60°$

18. $\sec\left(\text{Cos}^{-1}\frac{4}{5}\right)$ $\frac{5}{4}$

19. $\csc\left(\text{Sin}^{-1}\frac{9}{10}\right)$

$\frac{1}{\sin(\sin^{-1})\frac{9}{10}} = \frac{1}{\frac{9}{10}} = \frac{10}{9}$

20. $\cot(\text{Sin}^{-1}0)$

$\cot\theta = \frac{\cos\theta}{\sin\theta} = \frac{1}{0} = \varnothing$ UNDEFINED

(1, 0)