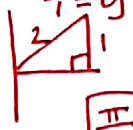
Algebra 2H Unit 7B Review – Inverse Trig Functions and Solving Trig Equations

Find the exact value of each of the following.

1. $\csc^{-1} 2$



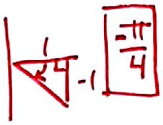
$\frac{\pi}{6}$

2. $\cot^{-1} 0$



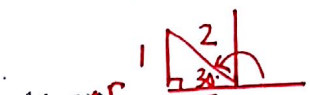
$\frac{\pi}{2}$

3. $\tan^{-1}(-1)$



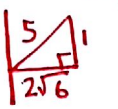
$-\frac{\pi}{4}$

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



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

5. $\cot(\csc^{-1} 5)$



$25 = x^2 + 1$, $2\sqrt{6} = x$

$\frac{x}{y} = 2\sqrt{6}$

6. $\sec\left(\sin^{-1}\frac{3}{4}\right)$

$x^2 + 9 = 16$, $x = \sqrt{7}$

$\frac{r}{x} = \frac{4}{\sqrt{7}} = \frac{4\sqrt{7}}{7}$

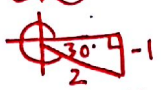
7. $\tan(\sec^{-1}(-3))$

$x = -1$, $r = 3$

$(-1)^2 + y^2 = 3^2$, $y = 2\sqrt{2}$

$\frac{y}{x} = \frac{2\sqrt{2}}{1} = 2\sqrt{2}$

8. $\cos^{-1}\left(\sin\frac{11\pi}{6}\right)$

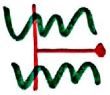


$= \cos^{-1}\left(-\frac{1}{2}\right)$

$\frac{2\pi}{3}$

9. $\tan^{-1}(\sin\pi)$

$\tan^{-1}(0)$, $0 = y$, $1 = x$



0

10. $\sin^{-1}\left(\cot\frac{\pi}{2}\right)$

$\sin^{-1}(0)$, $0 = y$, $1 = r$

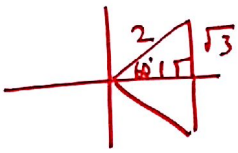


0

Solve the trig equations if $0° \le \theta < 360°$.

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

2 rev's!



$2\theta = 60°, 300°, 420°, 660°$ (+360°, +360°)

$\{30°, 150°, 210°, 330°\}$

12. $\cot\theta = \cos\theta$

$\cot\theta - \cos\theta = 0$

$\frac{\cos\theta}{\sin\theta} - \cos\theta = 0$

$\cos\theta\left(\frac{1}{\sin\theta} - \cos\theta\right) = 0$

$\cos\theta\left(\frac{1}{\sin\theta} - 1\right) = 0$

$\cos\theta = 0$, $0 = x$, $1 = r$

$\frac{1}{\sin\theta} - 1 = 0$

$\sin\theta = 1$

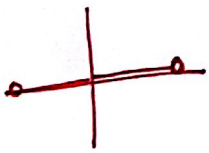


$\{\frac{\pi}{2}, \frac{3\pi}{2}\}$

Solve the trig equations if $0 \le \theta < 2\pi$.

13. $\sin\theta(3 + 5\cos\theta) = 0$

$\sin\theta = 0$, $0 = y$, $1 = r$



$0, \pi$

$5 + 3\cos\theta = 0$, $\cos\theta = -\frac{5}{3}$, $-5 = x$, $3 = r$

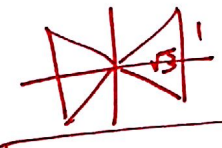
Can't happen!

$\{0, \pi\}$

13. $3\tan^2\theta = 1$

$\tan^2\theta = \frac{1}{3}$

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



ref. $\angle = 30°$

$\{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}\}$

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