

Solve the following equations for x on the interval $[0, 2\pi)$

1. $\sqrt{3} \sec x - 2 = 0$

$\sqrt{3} \sec x = 2$

$\sec x = \frac{2}{\sqrt{3}}$

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

$x = \frac{\pi}{6}, \frac{11\pi}{6}$

3. $2 \sin x = \sqrt{2}$

$\sin x = \frac{\sqrt{2}}{2}$

$x = \frac{\pi}{4}, \frac{3\pi}{4}$

5. $\cot x - \cot x \sec x = 0$

$\cot x (1 - \sec x) = 0$

$\cot x = 0$

$1 - \sec x = 0$

$\tan x = 0$

$1 = \sec x$

= undefined

$1 = \cos x$

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

$x = 0$

~~7. $8 \cos 30 = -4\sqrt{3}$~~

2. $3 \csc^2 x - 4 = 0$

$3 \csc^2 x = 4$

$\csc^2 x = \frac{4}{3}$

$\csc x = \pm \frac{\sqrt{4}}{\sqrt{3}} = \frac{2}{\sqrt{3}}$

$\sin x = \pm \frac{\sqrt{3}}{2}$

$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

4. $2 \cos^2 x + \cos x - 1 = 0$

$(2 \cos x - 1)(\cos x + 1) = 0$

$2 \cos x - 1 = 0$

$\cos x + 1 = 0$

$2 \cos x = 1$

$\cos x = -1$

$\cos x = \frac{1}{2}$

$x = \pi$

$x = \frac{\pi}{3}, \frac{5\pi}{3}$

6. $(3 \tan^2 x - 1)(\tan^2 x - 3) = 0$

$3 \tan^2 x - 1 = 0$

$\tan^2 x - 3 = 0$

$3 \tan^2 x = 1$

$\tan^2 x = 3$

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

$\tan x = \pm \sqrt{3}$

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

$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$ $x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

~~8. $\frac{3}{4} \tan(30) = -\frac{\sqrt{3}}{4}$~~

Will Not be an QUIZ!

Evaluate each of the following expressions.

9. $\tan(\arcsin 0)$

$$\tan(0)$$

$$= \boxed{0}$$

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

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

$$= \boxed{\frac{\sqrt{3}}{2}}$$

11. $\arccos\left(\sin\frac{3\pi}{4}\right)$

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

$$= \boxed{\frac{\pi}{4}}$$

12. $\tan^{-1}\left(\sin\frac{3\pi}{2}\right)$

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

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

13. $\cos(\tan^{-1} 0)$

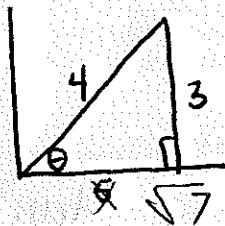
$$\cos(0)$$

$$= \boxed{1}$$

14. $\arccos\left(-\frac{\sqrt{3}}{2}\right)$

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

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



~~$$\tan\theta = \frac{3}{5}$$~~

$$9 + b^2 = 16$$

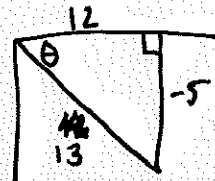
$$b^2 = 7$$

$$b = \pm\sqrt{7}$$

$$\tan\theta = \frac{3}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$$

$$= \boxed{\frac{3\sqrt{7}}{7}}$$

16. $\cos\left(\arctan\left(-\frac{5}{12}\right)\right)$



$$12^2 + (-5)^2 = c^2$$

$$144 + 25 =$$

$$169 = c^2$$

$$13 = c$$

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

17. Evaluate: $\sin\left(\frac{\pi}{3} + \frac{\pi}{4}\right)$

$$u = \frac{\pi}{3} \quad v = \frac{\pi}{4}$$

$$\sin\left(\frac{\pi}{3}\right) \cos\left(\frac{\pi}{4}\right) + \cos\left(\frac{\pi}{3}\right) \sin\left(\frac{\pi}{4}\right)$$

$$\left(\frac{\sqrt{3}}{2}\right) \left(\frac{\sqrt{2}}{2}\right) + \left(\frac{1}{2}\right) \left(\frac{\sqrt{2}}{2}\right)$$

$$= \frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4} = \boxed{\frac{\sqrt{6} + \sqrt{2}}{4}}$$

18. Evaluate: $\cos 15^\circ$

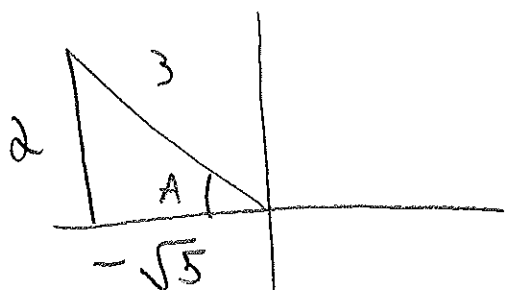
$$\cos(45^\circ - 30^\circ)$$

$$\cos(45) \cos(30) + \sin(45) \sin(30)$$

$$\left(\frac{\sqrt{2}}{2}\right) \left(\frac{\sqrt{3}}{2}\right) + \left(\frac{\sqrt{2}}{2}\right) \left(\frac{1}{2}\right)$$

$$\frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4} = \boxed{\frac{\sqrt{6} + \sqrt{2}}{4}}$$

19. Given $\sin A = \frac{2}{3}$ and $\sin B = -\frac{1}{3}$ and A is in QII while B is in QIV, find $\cos(A+B)$ and $\sin(A-B)$.



$$4 + b^2 = 9$$

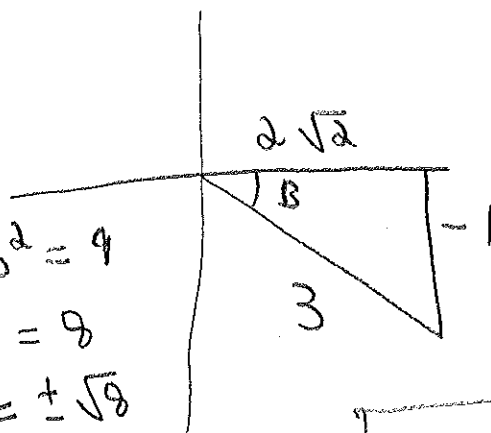
$$b^2 = 5$$

$$b = \pm \sqrt{5}$$

$$\cos(A+B) = \cos A \cos B - \sin B \sin A$$

$$\left(\frac{-\sqrt{5}}{3}\right) \left(\frac{2\sqrt{2}}{3}\right) - \left(\frac{-1}{3}\right) \left(\frac{2}{3}\right)$$

$$\frac{-2\sqrt{10}}{9} + \frac{2}{9} = \boxed{\frac{2 - 2\sqrt{10}}{9}}$$



$$1 + b^2 = 9$$

$$b^2 = 8$$

$$b = \pm \sqrt{8}$$

$$= \pm \sqrt{4} \sqrt{2} = \boxed{\pm 2\sqrt{2}}$$

$$\sin(A-B)$$

$$= \sin A \cos B - \cos A \sin B$$

$$\left(\frac{2}{3}\right) \left(\frac{2\sqrt{2}}{3}\right) - \left(\frac{-\sqrt{5}}{3}\right) \left(\frac{-1}{3}\right)$$

$$\frac{4\sqrt{2}}{9} - \frac{\sqrt{5}}{9}$$

$$= \boxed{\frac{4\sqrt{2} - \sqrt{5}}{9}}$$

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