

$$\textcircled{1} \sec^2 x - \tan^2 x - \sin^2 x = \cos^2 x$$

$$1 - \sin^2 x = \cos^2 x$$

$$\cos^2 x = \cos^2 x$$

$$4 \frac{\sec x - \cos x}{\tan} = \sin$$

$$\frac{\frac{1}{\cos} - \cos x}{\frac{\sin}{\cos}} = \frac{1 - \cos^2}{\cos} \cdot \frac{\cos}{\sin}$$

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

$$\textcircled{2} \frac{\csc^2 x - \cot^2 x}{\sec^2 x} = \cos^2 x$$

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

$$\cos^2 x = \cos^2 x$$

$$\textcircled{5} 3\cos^2 x - \cos x = 2 \quad y = \cos x$$

$$3y^2 - y - 2 = 0 \rightarrow 3y^2 - y - 2 = 0$$

$$y^2 - y - 6 = 0$$

$$(y + \frac{2}{3})(y - 3) = 0$$

$$\textcircled{1} \cos x = -\frac{2}{3}$$

Not on unit circle

$$\cos x = 1$$

$$|x = 0|$$

$$\textcircled{3} \frac{\sin 3x}{\sin x \cdot \cos x} = 4\cos x - \sec x$$

$$[\sin(a+b) = \sin a \cos b + \cos a \sin b]$$

$$\frac{\sin(2x+x)}{\sin x \cos x} =$$

$$[\sin 2x = 2\sin x \cos x]$$

$$\frac{\sin 2x \cos x + \cos 2x \sin x}{\sin x \cos x} =$$

$$[\cos 2x = 2\cos^2 x - 1]$$

$$\frac{2\sin x \cos x \cos x + (2\cos^2 x - 1)\sin x}{\sin x \cos x} =$$

$$\frac{4\cos^2 x \sin x - \sin x}{\sin x \cos x}$$

$$\frac{4\cos^2 x \sin x}{\sin x \cos x} - \frac{\sin x}{\cos x \sin x}$$

$$\frac{2\sin x \cos^2 x + 2\cos^2 x \sin x - \sin x}{\sin x \cos x} =$$

$$\frac{4\cos x}{\cancel{\sin x}} - \frac{1}{\cos x}$$

$$4\cos x - \sec x = 4\cos x - \sec x$$

$$6 \quad \sqrt{3} \csc x - 2 = 0$$

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

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

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

$$8 \quad 3 \csc^2 x = 4$$

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

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

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

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

$$7 \quad \cos 2x = -\cos x$$

$$\cos 2x + \cos x = 0$$

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

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

$$2x^2 + x - 1 = 0$$

$$x^2 + x - 2 = 0$$

$$(x-1)(x+2)$$

$$\sin x = \frac{1}{2} \quad \sin x = -1$$

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

$$9 \quad 3 \csc x - 1 = 5$$

$$\csc x = \frac{6}{3}$$

$$\csc x = 2$$

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

$$x = \frac{\pi}{6}, \frac{5\pi}{6}$$

$$10 \quad \sin^2 x - 2 = \sin x$$

$$\sin^2 x - \sin x - 2 = 0$$

$$(\sin x - 2)(\sin x + 1)$$

$$\sin x = 2$$

None

$$\sin x = -1$$

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

$$14 \quad \frac{\sin^2 x}{\cos^2 x} + 2 \tan x - 3$$

$$\tan^2 x + 2 \tan x - 3$$

$$(\tan x + 3)(\tan x - 1)$$

$$\tan x = -3, \tan x = 1$$

⑮ $(2 - 2\cos^2 x)(-\sin x - 1) \leftarrow$ grouping

$$2(1 - \cos^2 x) - \sin x - 1$$

$\underbrace{\hspace{10em}}_{\sin^2 x}$

$$2\sin^2 x - \sin x - 1$$

$(y = \sin x)$

$$2y^2 - y - 1$$

$$y^2 - y - 2$$

$$(y - 2)(y + 1) \rightarrow (y - 1)(2y + 1)$$

$$\frac{1}{2} \text{ ②}$$

$$(1 - \sin x)(2\sin x + 1)$$

⑩

S	A	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Quadrant <u>II</u> </div>
T	C	

⑰ Quadrant III

⑱ $\cos\left(\frac{\pi}{12}\right) = \cos\left(\frac{4\pi}{12} - \frac{3\pi}{12}\right)$

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

$$= \frac{1}{2} \cdot \frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2}$$

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

$$\textcircled{19} \sin(15) = \sin(45 - 30)$$

$$\sin 45 \cdot \cos 30 - \cos 45 \cdot \sin 30$$

$$\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2} \cdot \frac{1}{2} = \frac{\sqrt{6} - \sqrt{2}}{4}$$

$$\textcircled{20} X^2 = 13^2 + 8^2 - 2(13)(8)\cos(131)$$

$$X^2 = 369.46$$

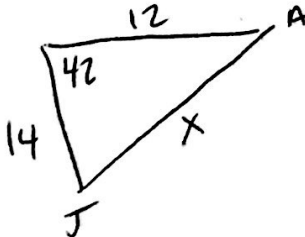
$$X = 19.22$$

$$8^2 = 13^2 + 19.22^2 - 2(13)(19.22)\cos B$$

$$64 = 538.41 - 500\cos B$$

$$.949 = \cos B$$

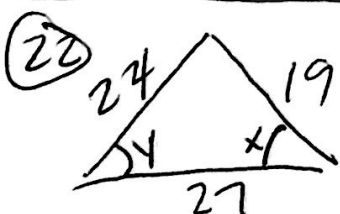
$$18^\circ = B$$

$$\textcircled{21}$$


$$X^2 = 12^2 + 14^2 - 2(12)(14)\cos(42)$$

$$X^2 = 90.3$$

$$X = 9.5 \text{ miles}$$



$$24^2 = 19^2 + 27^2 - 2(19)(27)\cos X$$

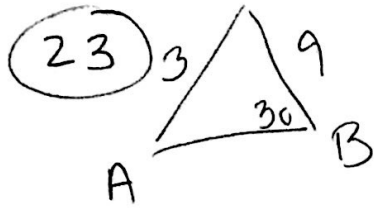
$$.5 = \cos X$$

$$60^\circ = X$$

$$\frac{\sin 60}{24} = \frac{\sin B}{19}$$

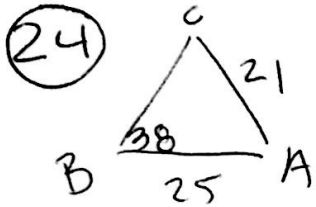
$$.69 = \sin B$$

$$43.3 = B$$



$$\frac{\sin 30}{3} = \frac{\sin A}{9}$$

$$\sin A = 1.5 \rightarrow \text{Not a } \Delta$$



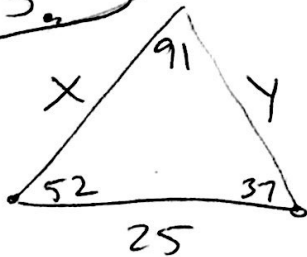
$$\frac{\sin 38}{21} = \frac{\sin C}{25}$$

$$0.734 = \sin C$$

$$\angle C = 47.13 \quad \angle A = 94.87$$

$$\frac{\sin 94.87}{a} = \frac{\sin 38}{21}$$

$$a = 33$$



$$\frac{\sin 91}{25} = \frac{\sin 37}{X}$$

$$X = 15.05$$

$$\frac{\sin 91}{25} = \frac{\sin 52}{Y}$$

$$Y = 19.7$$