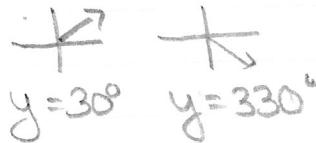


Worksheet

i) $\cos(2x+50^\circ) = \frac{\sqrt{3}}{2}$
 $\cos y = \frac{\sqrt{3}}{2}$
 $y_R = 30^\circ$


 $y = 30^\circ$ $y = 330^\circ$

$$y = \begin{cases} 30^\circ + 360^\circ n, n \in \mathbb{Z} \\ 330^\circ + 360^\circ n, n \in \mathbb{Z} \end{cases}$$

$$2x + 50^\circ = \begin{cases} 30^\circ + 360^\circ n \\ 330^\circ + 360^\circ n \end{cases}$$

$$\frac{1}{2} \cdot 2x = \frac{1}{2} \begin{cases} -20^\circ + 360^\circ n \\ 280^\circ + 360^\circ n \end{cases}$$

$$x = \begin{cases} -10^\circ + 180^\circ n, n \in \mathbb{Z} \\ 140^\circ + 180^\circ n, n \in \mathbb{Z} \end{cases}$$

$$-180^\circ \leq x \leq 180^\circ \text{ so } x = \{-10^\circ, 170^\circ, 140^\circ, -40^\circ\}$$

$$(x = \{-40^\circ, -10^\circ, 140^\circ, 170^\circ\})$$

ii) $y = \cos x$ $4y^2 + 4y + 1 = 0$
 $(2y+1)(2y+1) = 0$

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

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

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

$x_r = 60^\circ$


 $x = 120^\circ$ $x = 300^\circ$


 $x = 120^\circ$ $x = 300^\circ$

iii) $7 \cos(3x-18) = 4$

$y = 3x - 18$

$7 \cos y = 4$

$\cos y = \frac{4}{7}$

$y_r =$

$3x - 18 = \begin{cases} 0.96 + 2\pi n, n \in \mathbb{Z} \\ 5.32 + 2\pi n, n \in \mathbb{Z} \end{cases}$

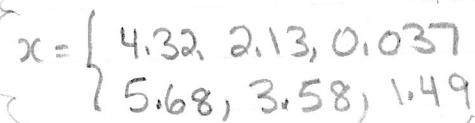
$\frac{1}{3} \cdot 3x = \frac{1}{3} \begin{cases} 18.96 + 2\pi n, n \in \mathbb{Z} \\ 23.32 + 2\pi n, n \in \mathbb{Z} \end{cases}$

$x = \begin{cases} 6.32 + 2\pi/3 n, n \in \mathbb{Z} \\ 7.77 + 2\pi/3 n, n \in \mathbb{Z} \end{cases}$



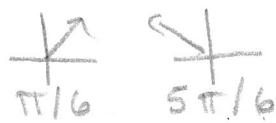
$y = 55.2^\circ \quad y = 304.8^\circ$
 $y = 0.96 \quad y = 5.32$

$0 \leq x \leq 2\pi$


 $x = \{4.32, 2.13, 0.037 \\ 5.68, 3.58, 1.49\}$

$$\text{IV} \quad \sin(\frac{\pi}{4}(x-6)) = 0.5 \quad \sin y = 0.5$$

$$y = (\frac{\pi}{4}(x-6)) \quad y_r = \frac{\pi}{6}$$



$$\frac{\pi}{4}(x-6) = \frac{\pi}{4} \left\{ \begin{array}{l} \frac{\pi}{6} + 2\pi n, n \in \mathbb{Z} \\ \frac{5\pi}{6} + 2\pi n, n \in \mathbb{Z} \end{array} \right.$$

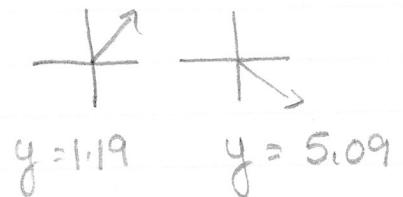
$$x-6 = \left\{ \begin{array}{l} \frac{2\pi}{3} + 8n, n \in \mathbb{Z} \\ \frac{10\pi}{3} + 8n, n \in \mathbb{Z} \end{array} \right.$$

$$x = \left\{ \begin{array}{l} \frac{20}{3} + 8n, n \in \mathbb{Z} \\ \frac{28}{3} + 8n, n \in \mathbb{Z} \end{array} \right.$$

$0 \leq x \leq 2\pi$
 $x: \{1.33\}$

$$\text{V) } 8 \cos(2x-5) = 3 \quad \cos y = \frac{3}{8}$$

$$y = 2x-5 \quad y_r = 1.19$$



$$2x-5 = \left\{ \begin{array}{l} 1.19 + 2\pi n, n \in \mathbb{Z} \\ 5.09 + 2\pi n, n \in \mathbb{Z} \end{array} \right.$$

$$2x = \left\{ \begin{array}{l} 6.19 + 2\pi n, n \in \mathbb{Z} \\ 10.09 + 2\pi n, n \in \mathbb{Z} \end{array} \right.$$

$$x = \left\{ \begin{array}{l} 3.095 + \pi n, n \in \mathbb{Z} \\ 5.045 + \pi n, n \in \mathbb{Z} \end{array} \right.$$

$$\text{VI) } 5.2 \sin 45(x+8^\circ) - 1 = -3 \quad y = 45(x+8^\circ)$$

$$5.2 \sin y - 1 = -3$$

$$5.2 \sin y = -2$$

$$\sin y = -2/5.2$$

$$y_r = \sin^{-1}(-2/5.2)$$

$$y_r = 22.6^\circ$$



$$\frac{1}{45} \cdot 45(x+8^\circ) = \frac{1}{45} \left\{ \begin{array}{l} 202.6^\circ + 360^\circ n \\ 337.4^\circ + 360^\circ n \end{array} \right.$$

$$x+8 = \left\{ \begin{array}{l} 4.50^\circ + 8n, n \in \mathbb{Z} \\ 7.50^\circ + 8n, n \in \mathbb{Z} \end{array} \right.$$

$$x = \left\{ \begin{array}{l} 12.5^\circ + 8n, n \in \mathbb{Z} \\ 15.5^\circ + 8n, n \in \mathbb{Z} \end{array} \right.$$

$$\text{vii) } 3\sin 2x = 2 \quad [y=2x] \quad \begin{array}{c} \nearrow \\ y=0.73 \end{array} \quad \begin{array}{c} \searrow \\ y=2.41 \end{array}$$

$$3\sin y = 2$$

$$\sin y = \frac{2}{3}$$

$$y_R = 0.73$$

$$\frac{1}{2} \cdot 2x = \frac{1}{2} \left\{ \begin{array}{l} 0.73 + 2\pi n, n \in \mathbb{Z} \\ 2.41 + 2\pi n, n \in \mathbb{Z} \end{array} \right.$$

$x = \left\{ \begin{array}{l} 0.365 + \pi n, n \in \mathbb{Z} \\ -1.205 + \pi n, n \in \mathbb{Z} \end{array} \right.$

$$\text{viii) } 4 \cos(x - 45^\circ) + 7 = 10 \quad [y=x-45^\circ] \quad \begin{array}{c} \nearrow \\ y=41.4^\circ \end{array} \quad \begin{array}{c} \searrow \\ y=318.4^\circ \end{array}$$

$$4 \cos y = 3$$

$$\cos y = \frac{3}{4}$$

$$y_R = 41.4^\circ$$

$$x - 45^\circ = \left\{ \begin{array}{l} 41.4^\circ + 360^\circ n \\ 318.4^\circ + 360^\circ n \end{array} \right.$$

$x = \left\{ \begin{array}{l} 86.4^\circ + 360^\circ n \\ 363.4^\circ + 360^\circ n \end{array} \right.$