$2\sin^2 2x - \sin 2x = 0$ $\quad 0 \le x < 2\pi$

$\sin 2x(2\sin 2x - 1) = 0$ $\quad 0 \le 2x < 4\pi$

$\sin 2x = 0 \qquad \sin 2x = 1/2$

$2x = 0, \pi, 2\pi, 3\pi \qquad 2x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{13\pi}{6}, \frac{17\pi}{6}$

$\boxed{x = 0, \pi/2, \pi, 3\pi/2} \qquad \boxed{x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}}$

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

$0 = \underbrace{\cos x \sin x - \cos x}\ \underbrace{- \sin x + 1}$

$0 = \cos x(\sin x - 1) - 1(\sin x - 1)$

$0 = (\sin x - 1)(\cos x - 1)$

$\sin x = 1, \quad \cos x = 1$

$\boxed{x = \frac{\pi}{2}} \qquad \boxed{x = 0}$

$\sin^2\theta + \cos^2\theta = 1$
$\sin^2\theta = 1 - \cos^2\theta$

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

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

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

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

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

$\cos 2x = -1/2$ $\qquad$ $\cos 2x = 1$

$2x = \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{8\pi}{3}, \frac{10\pi}{3}$ $\qquad$ $2x = 0, 2\pi$

$\boxed{x = \pi/3, 2\pi/3, 4\pi/3, 5\pi/3}$ $\qquad$ $\boxed{x = 0, \pi}$

$V = \frac{60 mi}{h}$, $r = 12 in$, $\quad \omega = ? \frac{rev}{min}$

$\frac{V}{r} = \frac{\cancel{r}\omega}{\cancel{r}} \Rightarrow \omega = \frac{V}{r} = \frac{V}{1} \cdot \frac{1}{r}$

$\omega = \frac{60 \cancel{mi}}{\cancel{h}} \cdot \frac{1}{\cancel{12 in}} \cdot \frac{1 \cancel{h}}{\cancel{60} min} \cdot \frac{\cancel{12 in}}{1 \cancel{ft}} \cdot \frac{5280 \cancel{ft}}{1 \cancel{mi}} \cdot \frac{1 rev}{2\pi}$

$= \boxed{\frac{2640}{\pi} rev/min}$

$y = -3\sec\left(2x + \frac{3\pi}{2}\right) - 1$

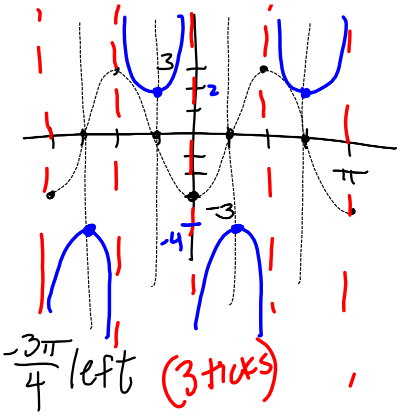
$y = a f(bx + c) + d$

amplitude : $|a|$ 3 (vert. flip)

period : $\frac{\pi \text{ or } 2\pi}{|b|}$ $\frac{2\pi}{2} = \pi$

vertical shift : d -1 down

phase shift (horizontal) : $\frac{-c}{b}$ $\frac{-3\pi/2}{2} = \frac{-3\pi}{4}$ left (3 ticks)



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

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

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

$A = 50°,\ b = 81,\ c = 34$ SAS

$a^2 = b^2 + c^2 - 2bc\cos A$

$a = \sqrt{81^2 + 34^2 - 2(81)(34)\cos 50°}$

$2\cos^3 x = \cos x$

$2\cos^3 x - \cos x = 0$

$\cos x\,(2\cos^2 x - 1) = 0$

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

$x = \frac{\pi}{2}, \frac{3\pi}{2}$ $\cos^2 x = 1/2$

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

$x = \pi/4,\ 3\pi/4,\ 5\pi/4,\ 7\pi/4$

$$2\cos^3 x = \cos x$$

$$2\cos^3 x - \cos x = 0$$

$$\cos x\left(2\cos^2 x - 1\right) = 0$$

$$\cos x = 0 \qquad 2\cos^2 x = 1$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2} \qquad \cos^2 x = \frac{1}{2}$$

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

$$x = \pi/4, 3\pi/4, 5\pi/4, 7\pi/4$$

$$\tan\frac{x}{2} = \frac{\tan x}{\sec x + 1} \qquad \tan\frac{x}{2} = \frac{1-\cos x}{\sin x}$$

$$= \frac{\sin x}{1+\cos x}$$

$$LHS = \frac{\sin x}{1+\cos x} =$$

$$\frac{\cancel{\frac{\cos x}{1}} \cdot \frac{\sin x}{\cancel{\cos x}}}{\cancel{\frac{\cos x \cdot 1}{\cos x}} + \cos x} = \frac{\cos x}{\cos x} \cdot \frac{\frac{\sin x}{\cos x}}{\left(\frac{1}{\cos x} + 1\right)} = RHS$$

$\sin 3x \cos 3x = \frac{1}{2}\sin 6x$

$\sin 2\theta =$
$2\sin\theta\cos\theta$

$$RHS = \frac{1}{2}\sin 2(3x)$$
$$= \frac{1}{\cancel{2}} \cdot \cancel{2}\sin 3x \cos 3x$$
$$= LHS$$