

Period § 1.5

Period of $\sin(5x)$ is ?

Period of sine is 2π

when does $5x$ reach 2π ?

$$5x = 2\pi$$

$$x = \frac{2\pi}{5} = T = \text{period.}$$

Build a sine function of period π

want $\sin(bx)$ to have period π

$$\text{want } b\pi = 2\pi$$

want bx to achieve 2π when $x = \pi$

$$b\pi = 2\pi$$

$$b = \frac{2\pi}{\pi} = 2$$

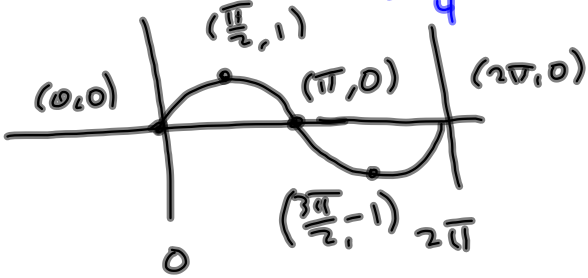
$$\sin(2x)$$

#61 $g(x) = 2 \sin(4x - \pi)$

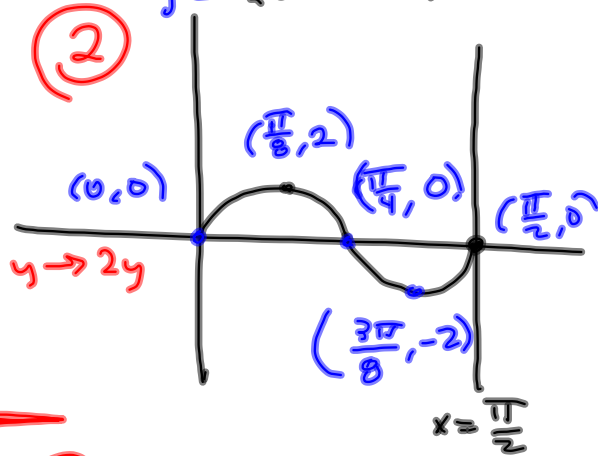
$= 2 \sin(4(x - \frac{\pi}{4}))$

$f(x) = \sin(x)$

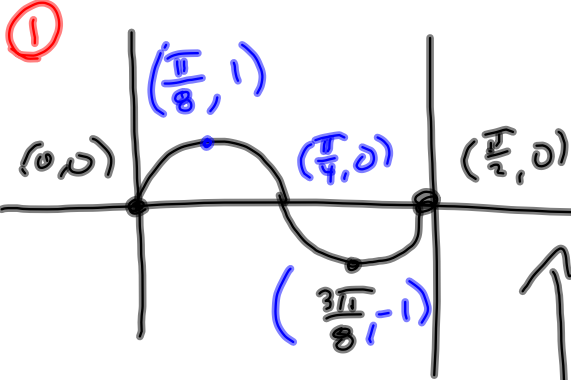
$\frac{\frac{\pi}{2}}{4} = \frac{\pi}{2} \cdot \frac{1}{4} = \frac{\pi}{8}$



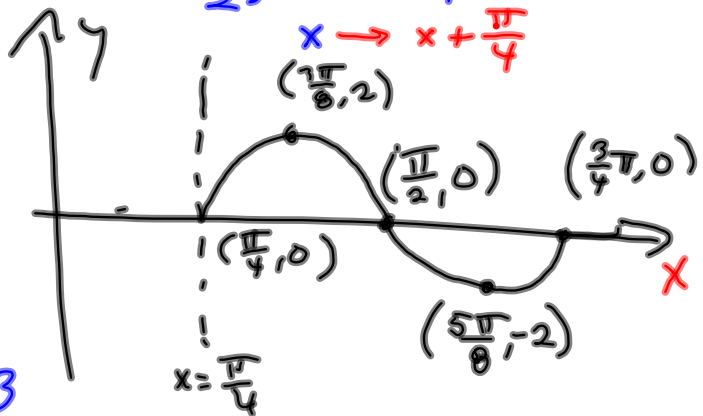
D:290 $y = 2 \sin(4x)$



$f(4x) = \sin(4x)$ $x \rightarrow \frac{1}{4}x$

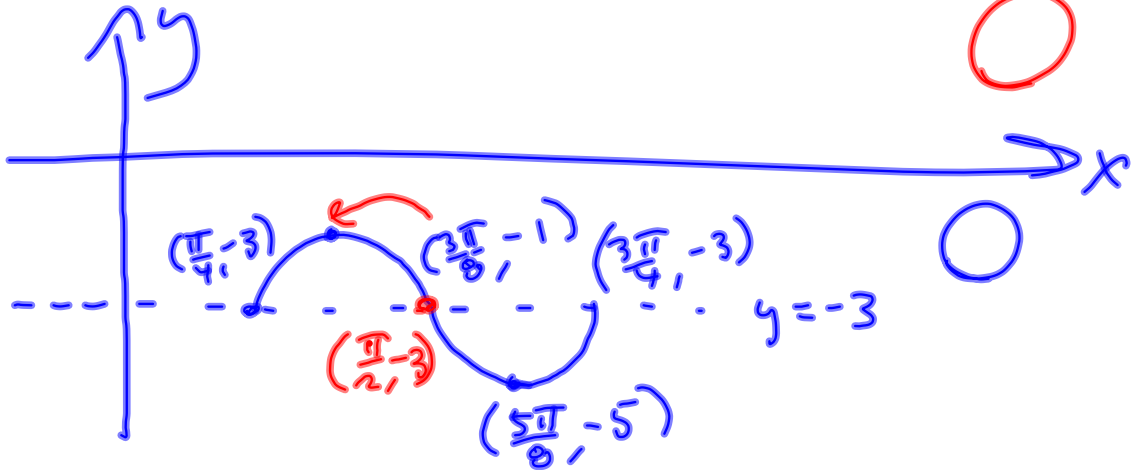


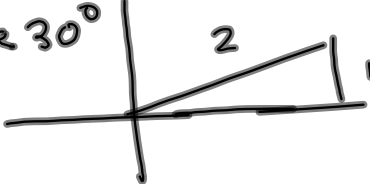
$2 \sin(4(x - \frac{\pi}{4}))$
 $x \rightarrow x + \frac{\pi}{4}$

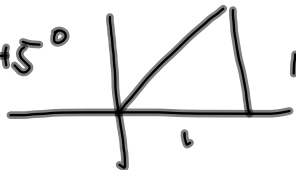


$\frac{\pi}{8} + \frac{\pi}{4} = \frac{3\pi}{8}$

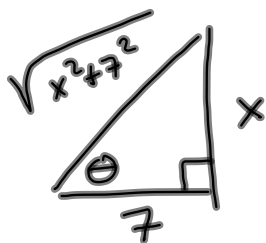
65 $2 \sin(4(x - \frac{\pi}{4})) - 3$



$$\arcsin\left(\frac{1}{2}\right) = \frac{\pi}{6} \text{ OR } 30^\circ$$


$$\arctan(1) = \frac{\pi}{4} \text{ OR } 45^\circ$$


write θ as function of x

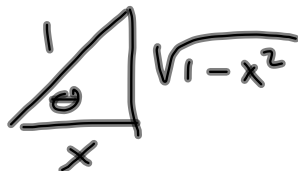


$$\arctan\left(\frac{x}{7}\right) = \arcsin\left(\frac{x}{\sqrt{x^2+49}}\right)$$

$$= \arccos\left(\frac{7}{\sqrt{x^2+49}}\right) = \theta$$

$$\cos(\arccos(x)) = x$$

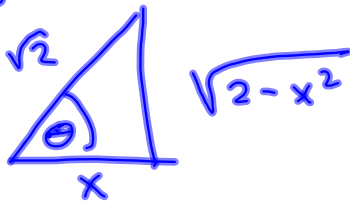
$$\sin(\underbrace{\arccos(x)}_{\theta}) = \sqrt{1-x^2}$$



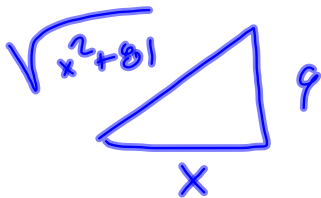
Test Monday

$$\tan\left(\underbrace{\arccos\left(\frac{x}{\sqrt{2}}\right)}_{\theta}\right) = \frac{\sqrt{2-x^2}}{x}$$

-



$$\arctan\left(\frac{9}{x}\right) = \arcsin\left(\frac{9}{\sqrt{x^2+81}}\right)$$



$$\int \frac{5}{\sqrt{x^2+1}} dx$$

↑
Some day

Trig
Substitution