Name key Date_____ Hour_____

Section 14.1 – 14.2 : Day 5

Alg 2 Trig G

TRANSFORMATIONS OF TRIG FUNCTIONS

$$y = A \bullet \sin(B(\theta - D)) + V$$

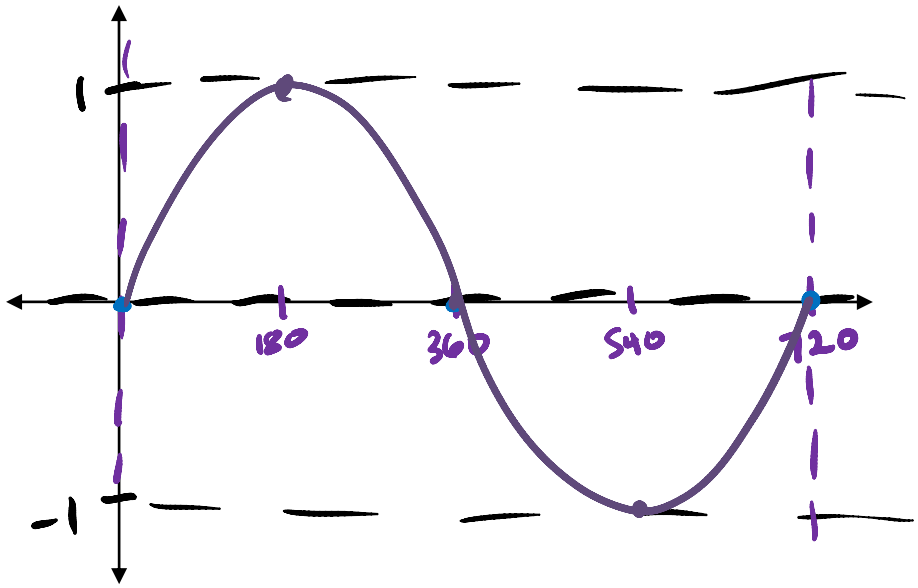
$$y = A \bullet \cos(B(\theta - D)) + V$$

V = vertical shift up or down (up or down)
A = amplitude vertical stretch or shrink
B = horizontal stretch or shrink
D = displacement phase shift (right or left)

We are adding horizontal stretches and shrinks to horizontal shifts!

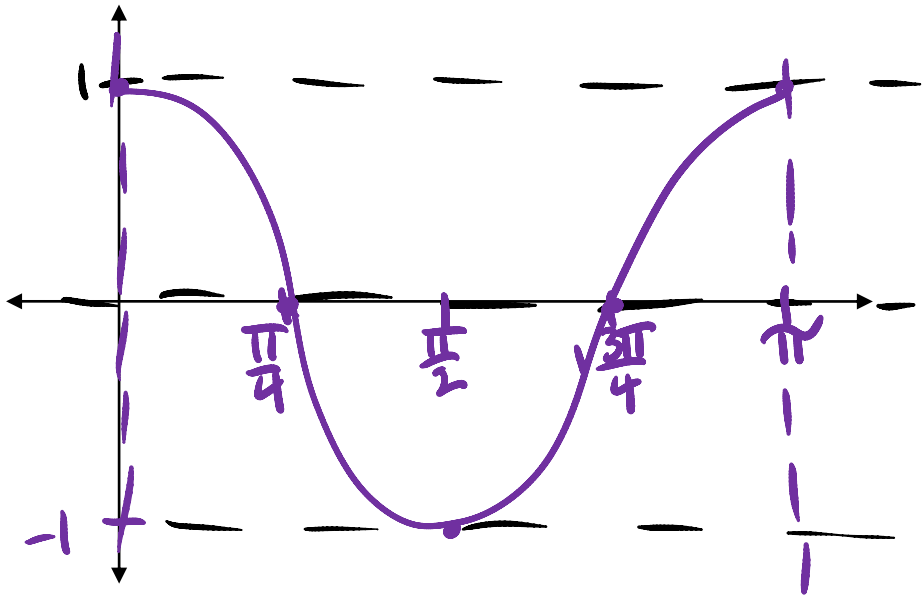
1. $y = \sin\left(\frac{1}{2}(\theta)\right)$ Amplitude: 1 Period: 720 ($360 \cdot 2$) Critical Values: 180 ($720/4$)

Vertical Shift: 0 Max: 1 Min: -1 Horizontal Shift: 0



2. $y = \cos(2(x))$ Amplitude: 1 Period: π ($2\pi \cdot \frac{1}{2}$) Critical Values: $\pi/4$, $\pi/4$

Vertical Shift: 0 Max: 1 Min: -1 Horizontal Shift: 0

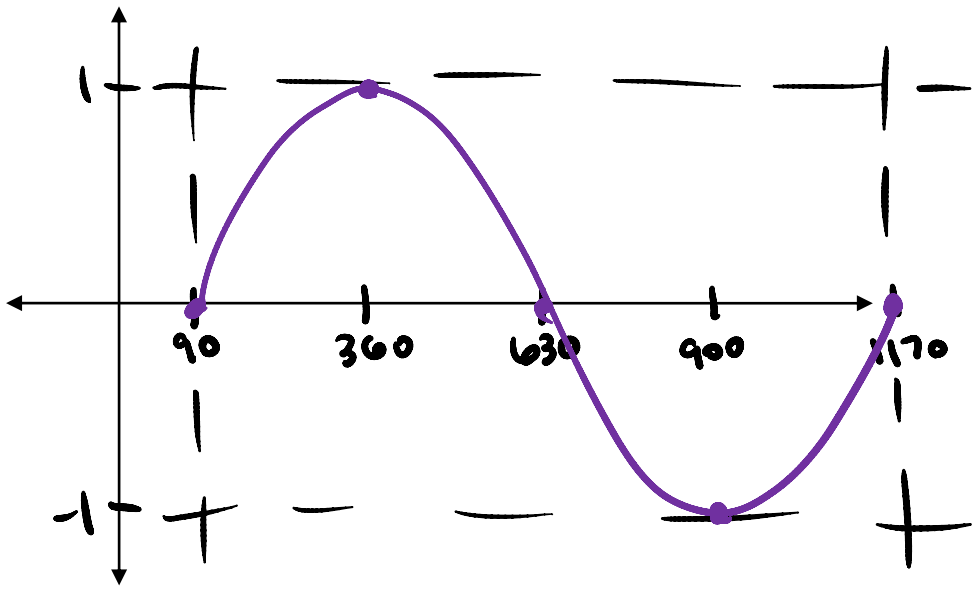


3. $y = \sin\left(\frac{1}{3}(\theta - 90)\right)$ Amplitude: 1 Period: 1080 ($360 \cdot 3$) Critical Values: 270 ($1080/4$)

right 90

Vertical Shift: 0 Max: 1 Min: -1 Horizontal Shift: +90

$0 \to 1080$
$+90$
$90^\circ \to 1170^\circ$



4. $y = \cos(2(\theta + 45))$

left 45

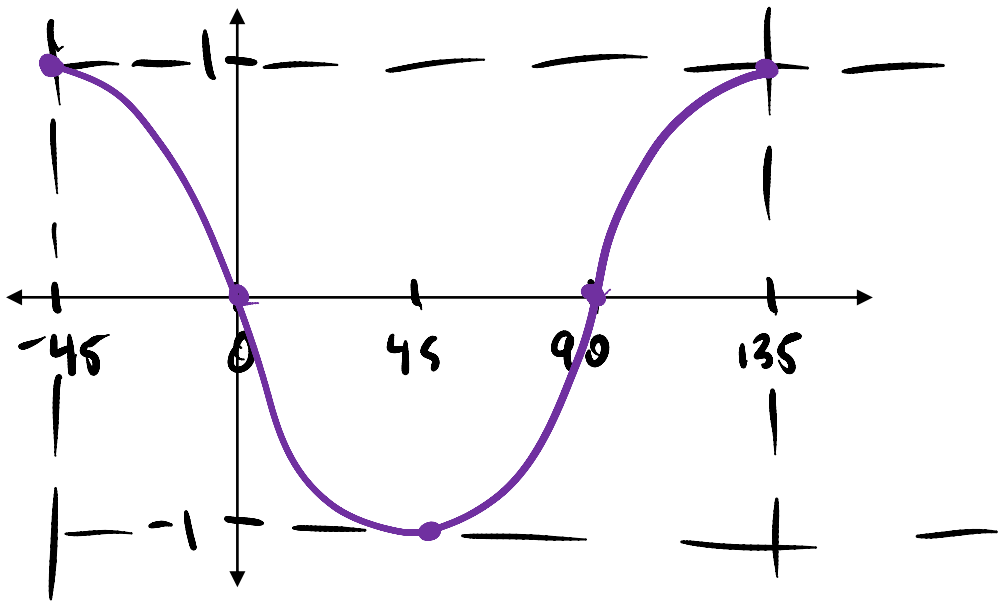
Amplitude: 1 Period: $180°$ ($360 \cdot \frac{1}{2}$) Critical Values: $45°$ ($180/4$)

Vertical Shift: 0 Max: 1 Min: -1 Horizontal Shift: -45

$0 \to 180°$

$-45°$

$\boxed{-45° \to 135°}$



5. $y = \sin(4(x - \pi))$

right π

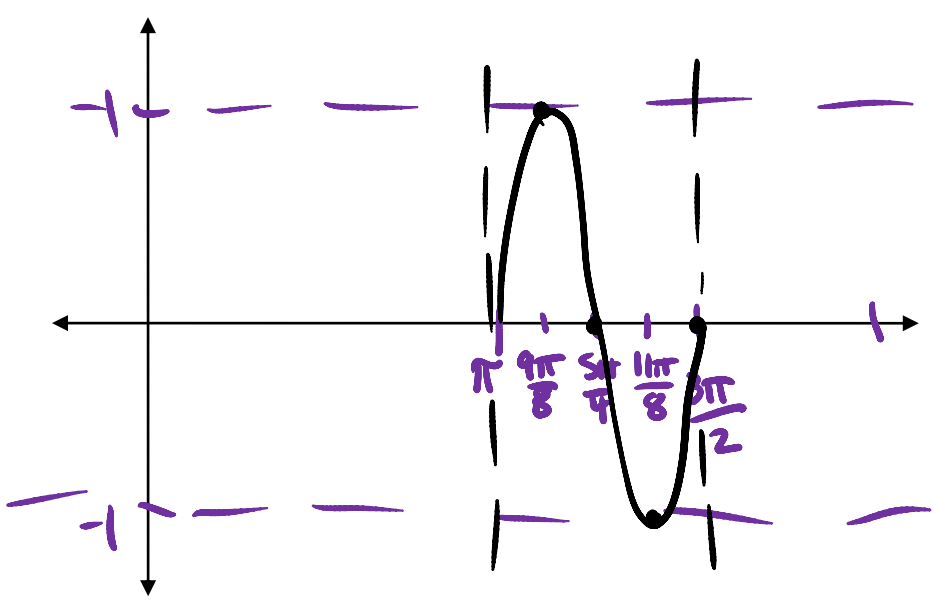
Amplitude: 1 Period: $\pi/2$ ($2\pi \cdot \frac{1}{4}$) Critical Values: $\frac{\pi}{8}$ ($\frac{\pi}{2}/4$)

Vertical Shift: 0 Max: 1 Min: -1 Horizontal Shift: $+\pi$

$0 \to \frac{\pi}{2}$

$+\pi$

$\boxed{\pi \to \frac{3\pi}{2}}$



6. $y = \sin\left(2(\theta - 60)\right)$

right 60

$360 \cdot \frac{1}{2}$ $180/4$

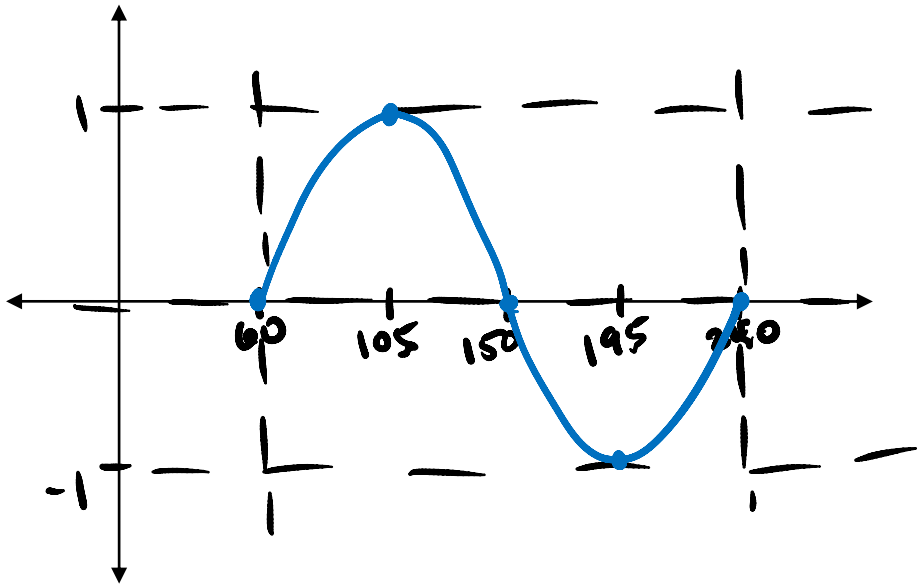
Amplitude: 1 Period: 180 Critical Values: 45

Vertical Shift: 0 Max: 1 Min: -1 Horizontal Shift: $+60°$

$0 \rightarrow 180°$

$+60$

$\boxed{60° \rightarrow 240°}$



7. $y = \cos\left(\frac{1}{4}(\theta - 90)\right)$

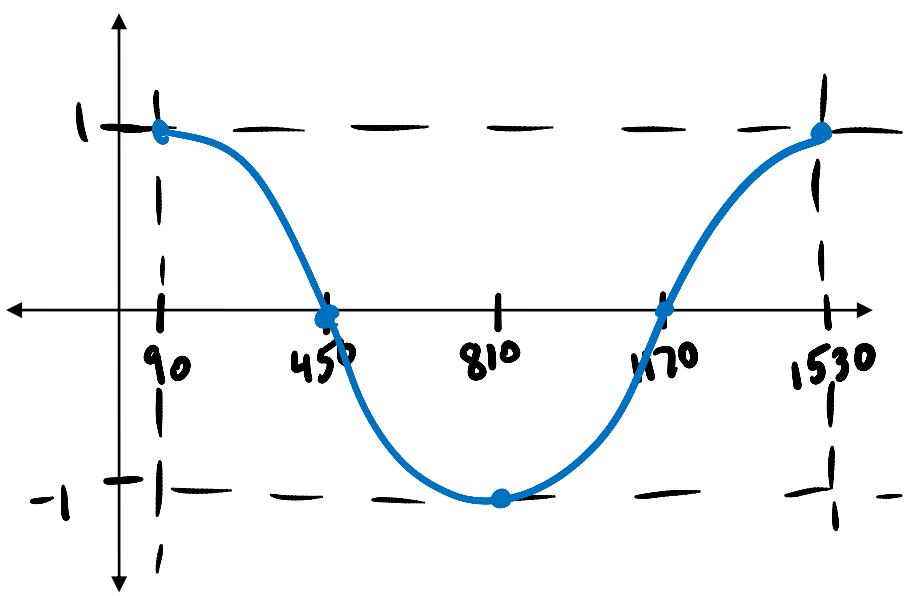
right 90°

$360 \cdot 4$ $1440/4$

Amplitude: 1 Period: 1440 Critical Values: 360

Vertical Shift: 0 Max: 1 Min: -1 Horizontal Shift: $+90°$

$0 \rightarrow 1440°$

$+90°$

$\boxed{90° \rightarrow 1530°}$