Trig Graphing WS
All Trig Graphs

Name Key

Graph one complete period for each function and give the period, and domain and range of that period.

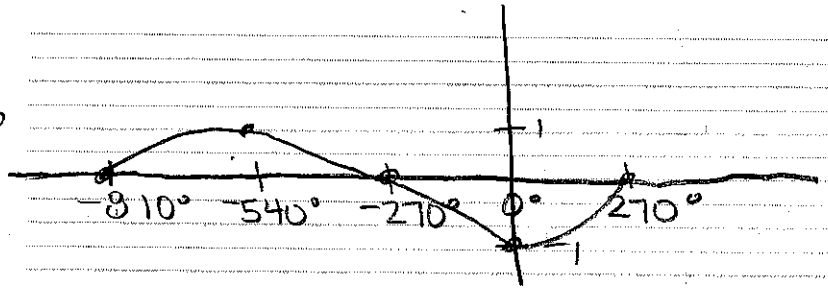
1) $y = \sin\left(\frac{\theta}{3} + 270°\right)$

$\frac{\theta}{3} + 270 = 0$ $\quad \frac{\theta}{3} + 270 = 360$

$3 \cdot \frac{\theta}{3} = -270 \cdot 3$ $\quad \frac{\theta}{3} = 90$

$\theta = -810°$ $\quad \theta = 270$

-810 -540 -270 0 270



pd $= \frac{360}{b} = \frac{360}{1/3} = 360 \cdot 3 = 1080°$

or $270 - -810°$

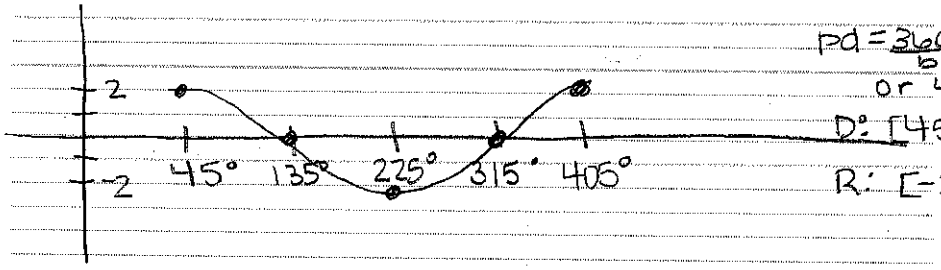
D: $[-810°, 270°]$

R: $[-1, 1]$

2) $y = 2\cos(\theta - 45°)$

$\theta - 45 = 0$ $\quad \theta - 45 = 360$

$\theta = 45°$ $\quad \theta = 405°$



pd $= \frac{360}{b} = \frac{360}{1} = 360°$

or $405 - 45$

D: $[45°, 405°]$

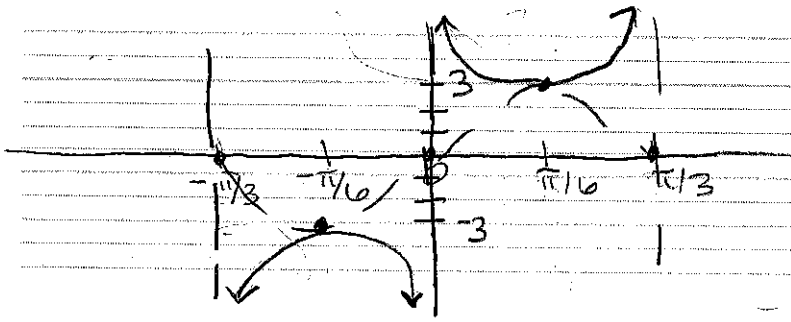
R: $[-2, 2]$

3) $y = -3\csc(3x + \pi)$ (Sin)

$3x + \pi = 0$ $\quad 3x + \pi = 2\pi$

$3x = -\pi$ $\quad 3x = \pi$

$x = -\frac{\pi}{3}$ $\quad x = \frac{\pi}{3}$



pd $= \frac{2\pi}{b} = \frac{2\pi}{3}$

or $\frac{\pi}{3} - -\frac{\pi}{3}$

D: $(-\frac{\pi}{3}, 0) \cup (0, \frac{\pi}{3})$

R: $(-\infty, -3] \cup [3, \infty)$

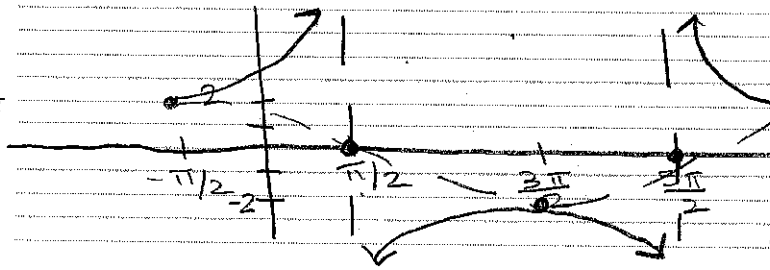
4) $y = 2\sec\left(\frac{1}{2}x + \frac{\pi}{4}\right)$ (cos)

$\frac{1}{2}x + \frac{\pi}{4} = 0$ $\quad \frac{1}{2}x + \frac{\pi}{4} = 2\pi$

$2 \cdot \frac{1}{2}x = -\frac{\pi}{4} \cdot 2$ $\quad 2 \cdot \frac{1}{2}x = \frac{7\pi}{4} \cdot 2$

$x = -\frac{\pi}{2}$ $\quad x = \frac{7\pi}{2}$

$-\pi/2$ $\pi/2$ $3\pi/2$ $5\pi/2$ $7\pi/2$



pd $= \frac{2\pi}{b} = \frac{2\pi}{1/2} = 2\pi \cdot 2 = 4\pi$

or $\frac{7\pi}{2} - -\frac{\pi}{2} = \frac{8\pi}{2}$

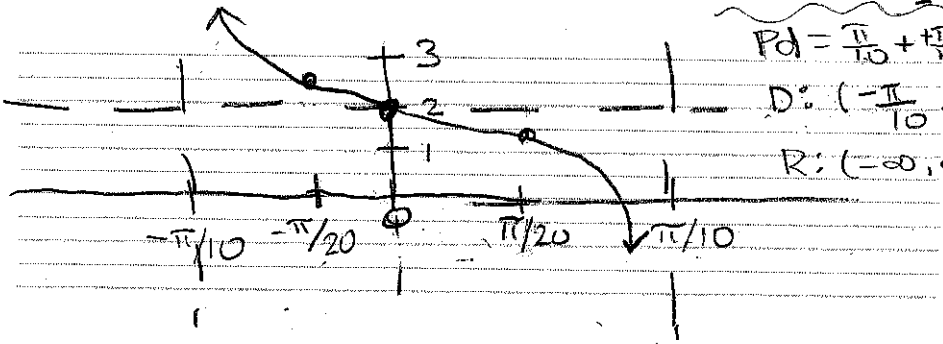
D: $[-\frac{\pi}{2}, \frac{\pi}{2}) \cup (\frac{\pi}{2}, \frac{5\pi}{2}) \cup (\frac{5\pi}{2}, \frac{7\pi}{2}]$

R: $(-\infty, -2] \cup [2, \infty)$

5) $y = -\frac{1}{2}\tan(5x) + 2$

$\frac{1}{5} \cdot 5x = -\frac{\pi}{2} \cdot \frac{1}{5}$ $\quad 5x = \frac{\pi}{2} \cdot \frac{1}{5}$

$x = -\frac{\pi}{10}$ $\quad x = \frac{\pi}{10}$



Pd $= \frac{\pi}{10} + \frac{\pi}{10} = \frac{2\pi}{10} = \frac{\pi}{5}$

D: $(-\frac{\pi}{10}, \frac{\pi}{10})$

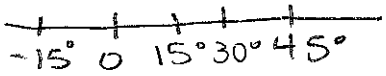
R: $(-\infty, \infty)$

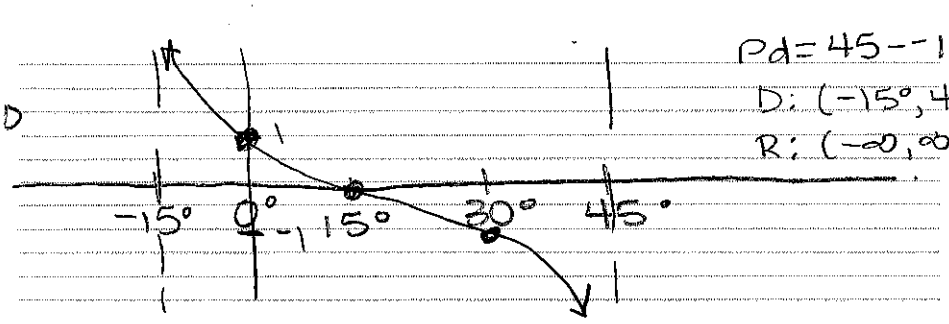
6) $y = \cot(3\theta + 45°)$

$3\theta + 45 = 0$ $\quad 3\theta + 45 = 180$

$3\theta = -45$ $\quad 3\theta = 135$

$\theta = -15°$ $\quad \theta = 45°$





Pd = 45 − −15 = 60°

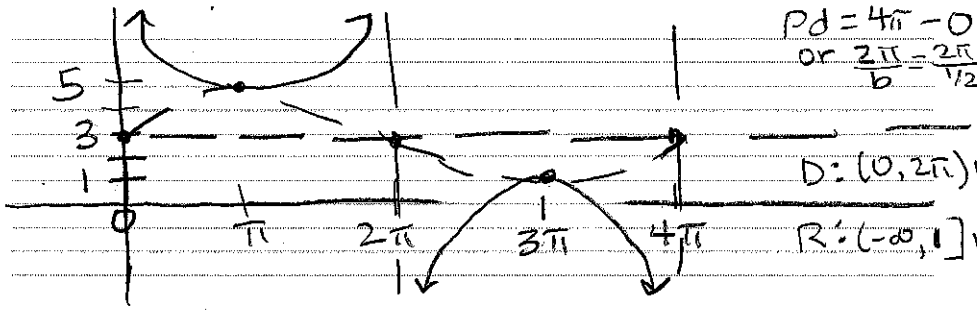
D: (−15°, 45°)

R: (−∞, ∞)

7) $y = 2\csc\frac{x}{2} + 3$ (sin)

$\frac{x}{2} = 0$ $\quad \frac{x}{2} = 2\pi$

$x = 0$ $\quad x = 4\pi$



Pd = 4π − 0 = 4π

or $\frac{2\pi}{b} = \frac{2\pi}{1/2} = 2\pi \cdot 2$

D: (0, 2π) ∪ (2π, 4π)

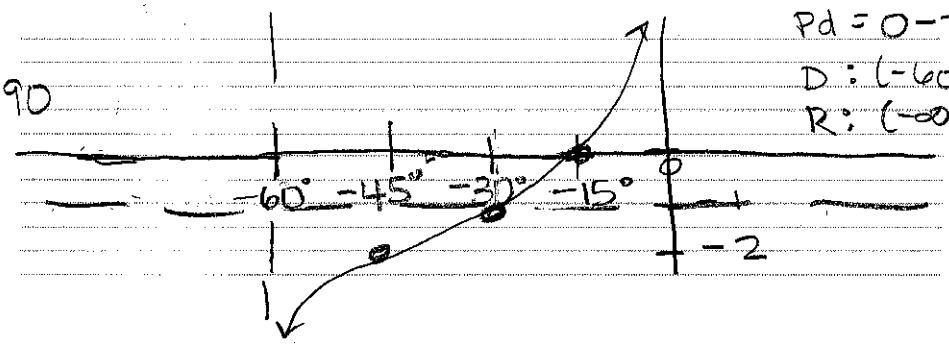
R: (−∞, 1] ∪ [5, ∞)

8) $y = \tan(3\theta + 90°) - 1$

$3\theta + 90 = -90$ $\quad 3\theta + 90 = 90$

$3\theta = -180$ $\quad 3\theta = 0$

$\theta = -60°$ $\quad \theta = 0°$



Pd = 0 − −60 = 60°

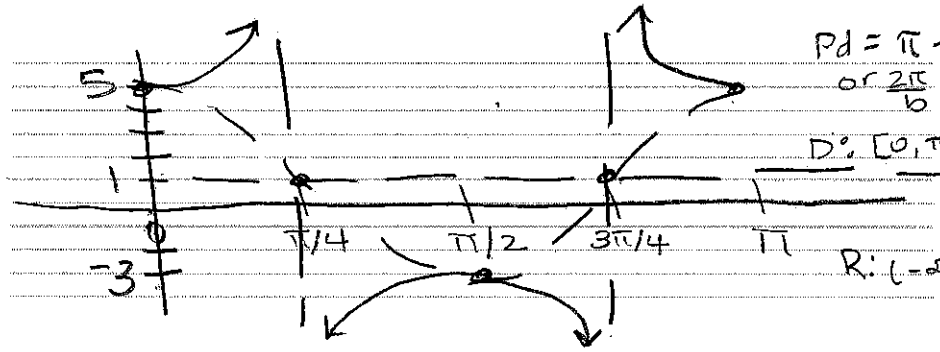
D: (−60°, 0°)

R: (−∞, ∞)

9) $y = 4\sec(2x) + 1$ (cos)

$2x = 0$ $\quad 2x = 2\pi$

$x = 0$ $\quad x = \pi$



Pd = π − 0 = π

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

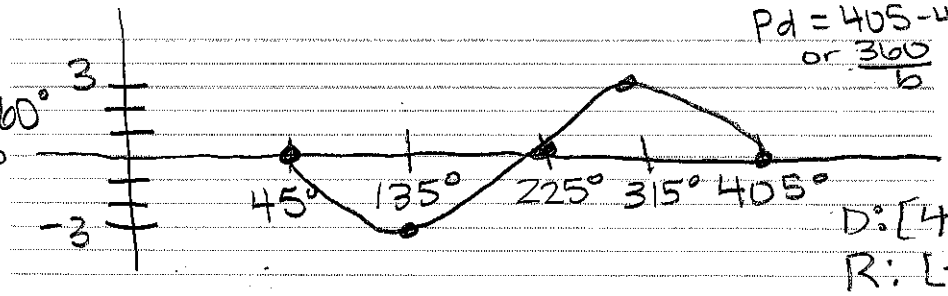
D: $[0, \pi/4) \cup (\frac{\pi}{4}, \frac{3\pi}{4}) \cup (\frac{3\pi}{4}, \pi]$

R: (−∞, −3] ∪ [5, ∞)

10) $y = -3\sin(\theta - 45°)$.

$\theta - 45 = 0$ $\quad \theta - 45 = 360°$

$\theta = 45°$ $\quad \theta = 405°$



Pd = 405 − 45 = 360°

or $\frac{360}{b} = \frac{360}{1}$

D: [45°, 405°]

R: [−3, 3]