

Out of 50 points

MAC1114 Test 2 Chapters 4-5 Name Key

Show all work for credit. All answers should be using exact values (no rounding or decimals). Complete graphs show any x intercepts, y intercepts, asymptotes, and end behavior. Only show **one** period of graphs.

flip x axis

$$A = -3 \quad B = 2 \quad C = -\frac{4\pi}{7} \quad D = 0$$

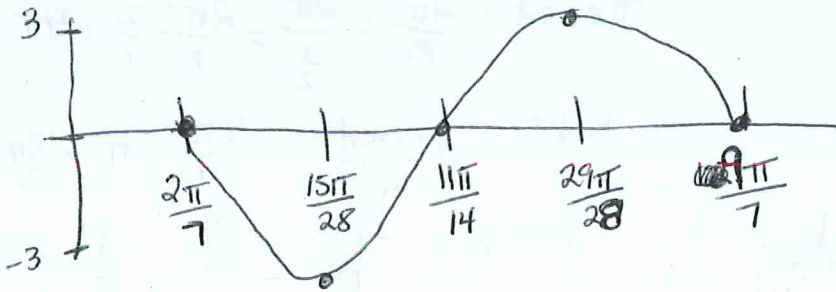
7

1. Graph $y = -3\sin(2x - \frac{4\pi}{7})$

$$\text{period} = \frac{2\pi}{B} = \frac{2\pi}{2} = \pi$$

$$\text{ticks} = \frac{\text{period}}{4} = \frac{\pi}{4} = \frac{7\pi}{28}$$

$$\text{phase} = -\frac{C}{B} = -\frac{-4\pi}{7} = \frac{4\pi}{7} = \frac{4\pi}{7} \cdot \frac{1}{2} = \frac{2\pi}{7} = \frac{8\pi}{28}$$



$$\frac{8\pi}{28} \quad \frac{15\pi}{28} \quad \frac{22\pi}{28} \quad \frac{29\pi}{28} \quad \frac{36\pi}{28}$$

7

2. Graph $y = \frac{1}{4}\cos(3x + \frac{5\pi}{6})$

$$A = \frac{1}{4} \quad B = 3 \quad C = \frac{5\pi}{6} \quad D = 0$$

$$\text{period} = \frac{2\pi}{B} = \frac{2\pi}{3}$$

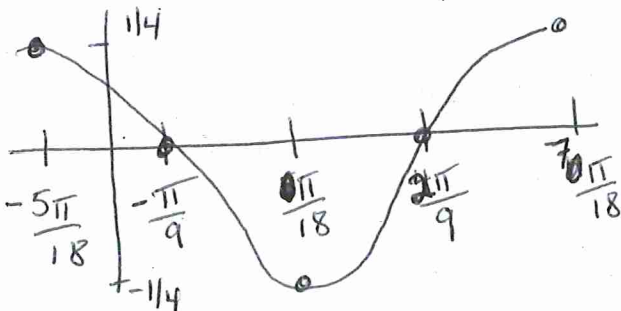
$$\text{ticks} = \frac{\text{period}}{4} = \frac{2\pi}{3} \cdot \frac{1}{4} = \frac{\pi}{6} = \frac{3\pi}{18}$$

$$= \frac{2\pi}{3} \cdot \frac{1}{4} = \frac{\pi}{6} = \frac{3\pi}{18}$$

$$\text{phase} = -\frac{C}{B} = -\frac{5\pi}{6} \cdot \frac{1}{3} = -\frac{5\pi}{18}$$

$$= -\frac{5\pi}{6} \cdot \frac{1}{3} = -\frac{5\pi}{18}$$

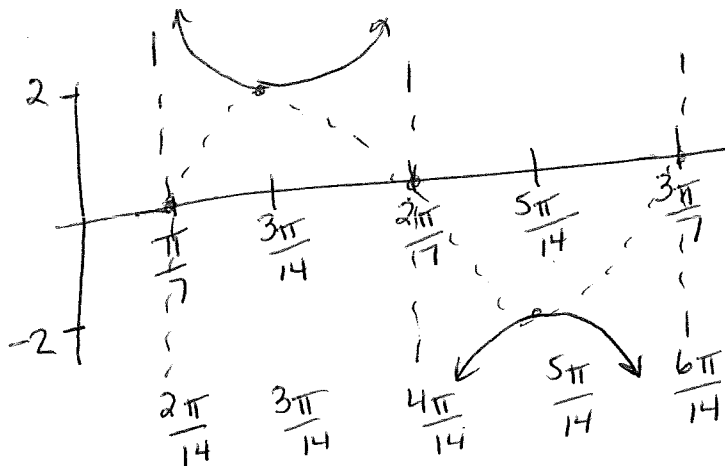
$$= -\frac{5\pi}{18}$$



$$-\frac{5\pi}{18} \quad -\frac{2\pi}{18} \quad \frac{7\pi}{18} \quad \frac{4\pi}{18} \quad \frac{7\pi}{18}$$

$$A=2 \quad B=7 \quad C=-\pi \quad D=0$$

10 3. Graph $y = 2\csc(7x - \pi)$



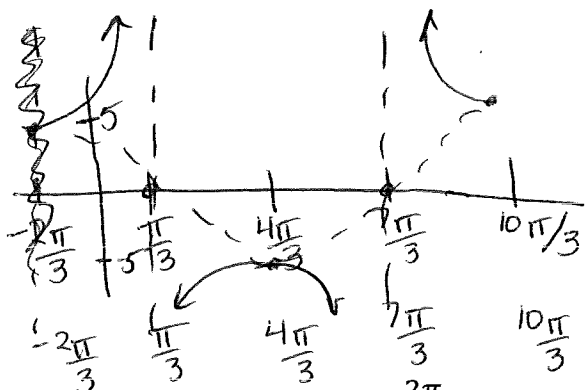
$$\text{period} = \frac{2\pi}{B} = \frac{2\pi}{7}$$

$$\text{ticks} = \frac{\text{period}}{4} = \frac{2\pi}{7} \cdot \frac{1}{4} = \frac{\pi}{14}$$

$$\text{phase} = \frac{-C}{B} = \frac{-(-\pi)}{7} = \frac{\pi}{7} = \frac{2\pi}{14}$$

10 4. Graph $y = 5\sec(\frac{1}{2}x + \frac{\pi}{3})$

$$A=5 \quad B=\frac{1}{2} \quad C=\frac{\pi}{3} \quad D=0$$



$$\text{Period} = \frac{2\pi}{B} = \frac{2\pi}{\frac{1}{2}} = 2\pi \cdot \frac{2}{1} = 4\pi$$

$$\text{ticks} = \frac{\text{period}}{4} = \frac{4\pi}{4} = \pi = \frac{3\pi}{3}$$

$$\text{phase} = \frac{-C}{B} = \frac{-\frac{\pi}{3}}{\frac{1}{2}} = -\frac{\pi}{3} \cdot \frac{2}{1} = -\frac{2\pi}{3}$$

5. Graph $y = \cot(5x + \frac{2\pi}{9})$

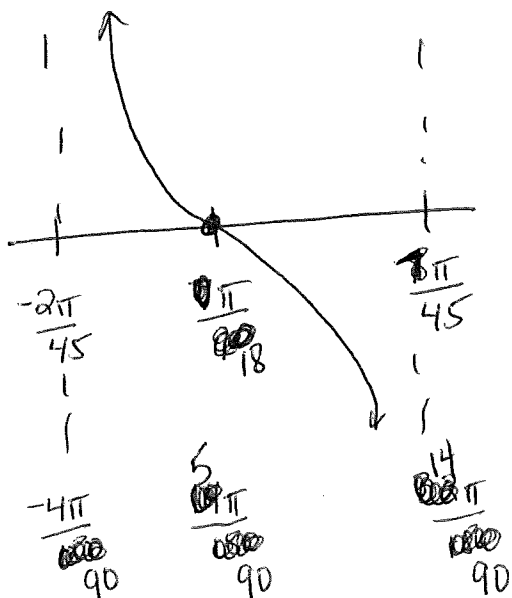
$$A=1 \quad B=5 \quad C=\frac{2\pi}{9}$$

$$\text{period} = \frac{\pi}{B} = \frac{\pi}{5}$$

$$\text{ticks} = \frac{\text{period}}{2} = \frac{\frac{\pi}{5}}{2} = \frac{\pi}{10} = \frac{9}{90}$$

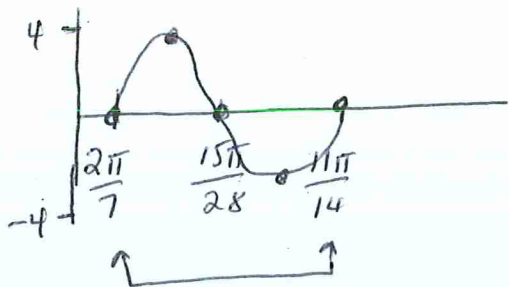
$$\text{phase} = \frac{-C}{B} = \frac{-\frac{2\pi}{9}}{5} = -\frac{2\pi}{9} \cdot \frac{1}{5} = -\frac{2\pi}{45} = -\frac{4\pi}{90}$$

6



6. Find a sine equation with x intercepts at $x = \frac{2\pi}{7}, \frac{15\pi}{28}, \frac{11\pi}{14}$ and

5 maximum at $(\frac{23\pi}{56}, 4)$ and minimum at $(\frac{37\pi}{56}, -4)$.



period = $4 = A$

phase = $\frac{2\pi}{7} = \frac{-C}{B}$

Period = $\frac{2\pi}{B} = \frac{\pi}{2} \Rightarrow \pi B = 4\pi$
 $B = 4$

period = $\frac{11\pi}{14} - \frac{2\pi}{7} = \frac{11\pi}{14} - \frac{4\pi}{14} = \frac{7\pi}{14} = \frac{\pi}{2}$

$$y = 4 \sin\left(4x - \frac{8\pi}{7}\right)$$

$$\frac{2\pi}{7} = \frac{-C}{4}$$

$$8\pi = -7C$$

$$-\frac{8\pi}{7} = C$$

7. Choose one of the two identities to verify. Only work on one side.

5

$cscx \cos^2x + \sinx = cscx$ OR

$$\frac{\sin 2x}{\sin x} = \frac{2}{\sec x}$$

$$\frac{1}{\sin x} \cdot \frac{\cos^2 x}{1} + \sin x$$

$$\frac{2 \sin x \cos x}{\sin x}$$

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

$$2 \cos x$$

$$\frac{\cos^2 x}{\sin x} + \frac{\sin^2 x}{\sin x}$$

$$2 \left(\frac{1}{\sec x}\right)$$

$$\frac{\cos^2 x + \sin^2 x}{\sin x}$$

$$\boxed{\frac{2}{\sec x}}$$

$$\frac{1}{\sin x}$$

$$\boxed{csc x}$$

