Pre-Calculus
1.5 Graphs of Sine and Cosine Functions
Assignment #44

Name Key

Period _____ Group # _____

Determine the amplitude and period of each function.

1. $y = \sin 4x$

Amplitude = 1

Period = $\pi/2$

2. $y = \cos 5x$

Amplitude = 1

Period = $2\pi/5$

3. $y = \sin x$

Amplitude = 1

Period = 2π

4. $y = 4 \cos x$

Amplitude = 4

Period = 2π

5. $y = -2 \sin x$

Amplitude = 2

Period = 2π

6. $y = 2 \sin(-4x)$

Amplitude = 2

Period = $\pi/2$

7. $y = 3 \sin \frac{2}{3}x$

Amplitude = 3

Period = 3π

8. $y = -4 \cos 5x$

Amplitude = 4

Period = $2\pi/5$

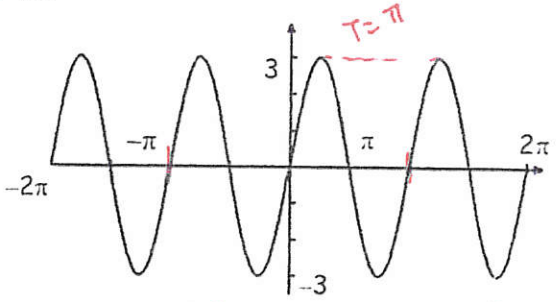
9. $y = 3 \cos(-2x)$

Amplitude = 3

Period = π

Give the amplitude and period of each function graphed below. Then write an equation of each graph.

10.



$T = \pi$

Amplitude = 3

Period = π

Equation: $y = 3\sin(2x)$

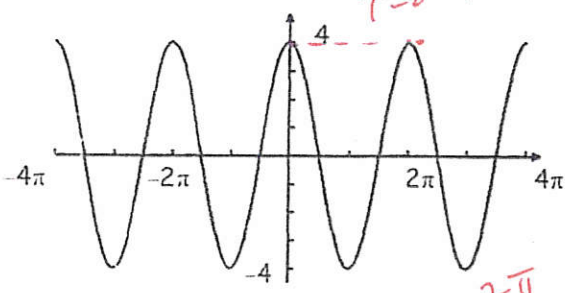
$T = \frac{2\pi}{\omega}$

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

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

$\omega = 2$

11.



$T = 2\pi$

Amplitude = 4

Period = 2π

Equation: $y = 4\cos x$

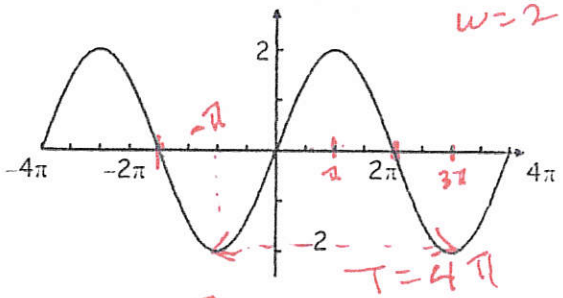
$T = \frac{2\pi}{\omega}$

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

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

$\omega = 1$

12.



$T = 4\pi$

Amplitude = 2

Period = 4π

Equation: $y = 2\sin(\frac{1}{2}x)$

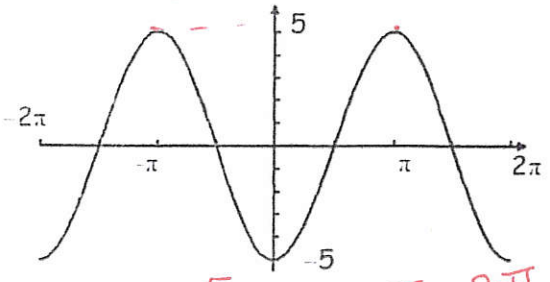
$T = \frac{2\pi}{\omega}$

$4\pi = \frac{2\pi}{\omega}$

$\omega = \frac{2\pi}{4\pi}$

$\omega = \frac{1}{2}$

13.



$T = 2\pi$

Amplitude = 5

Period = 2π

Equation: $y = -5\cos x$

$T = \frac{2\pi}{\omega}$

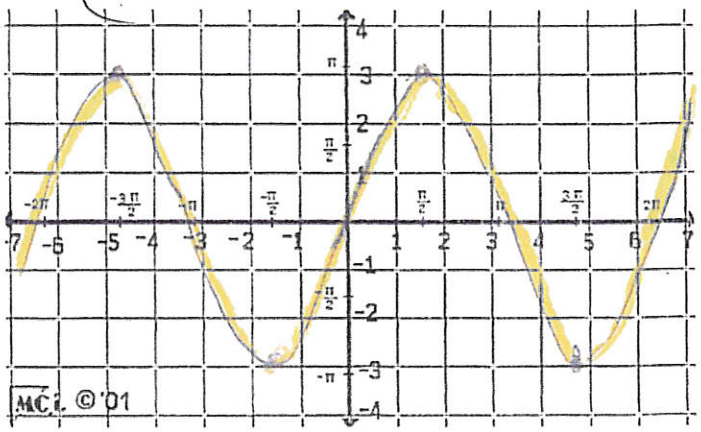
$2\pi = \frac{2\pi}{\omega}$

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

$\omega = 1$

Give the amplitude and period of each function. Then sketch the graph of the function over the interval $-2\pi \le x \le 2\pi$ using the key points for each function.

14. $y = 3 \sin x$



Amplitude = 3

Period = 2π

$\omega = 1$

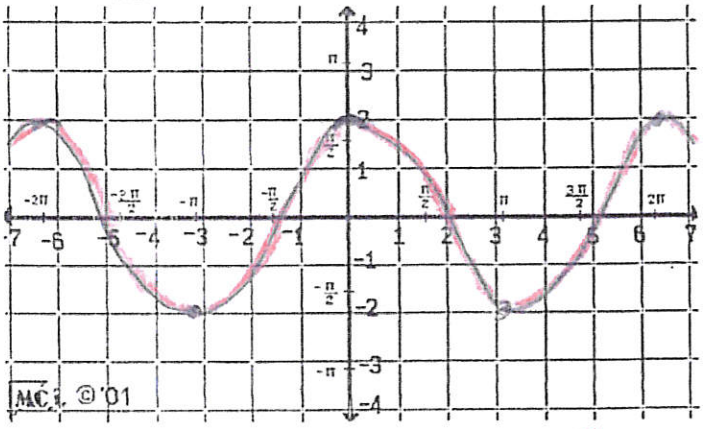
$T = \frac{2\pi}{\omega}$

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

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

$\omega = 1$

15. $y = 2 \cos x$



Amplitude = 2

Period = 2π

$\omega = 1$

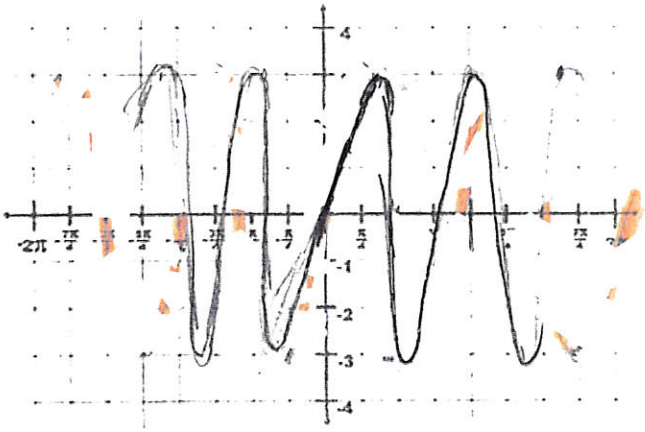
$T = \frac{2\pi}{\omega}$

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

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

$\omega = 1$

16. $y = 3\sin(3x)$



Amplitude = 3

Period = $2\pi/3$

$\omega = 3$

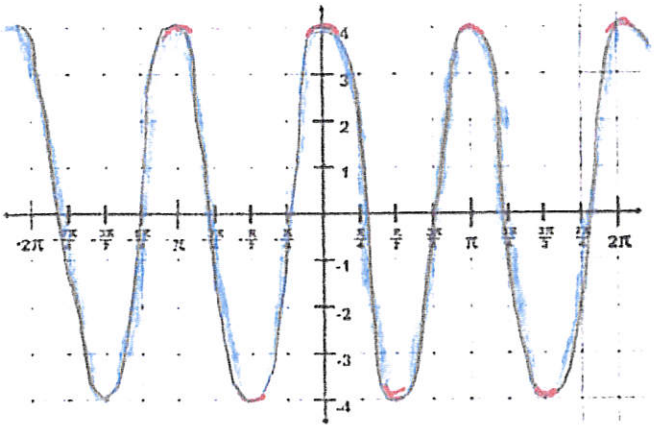
$T = \frac{2\pi}{\omega}$

$\frac{2\pi}{3} = \frac{2\pi}{\omega}$

$\omega = \frac{2\pi}{2\pi/3} \Rightarrow 2\pi \cdot \frac{3}{2\pi} = 3$

$\omega = 3$

17. $y = 4 \cos 2x$



Amplitude = 4

Period = π

$\omega = 2$

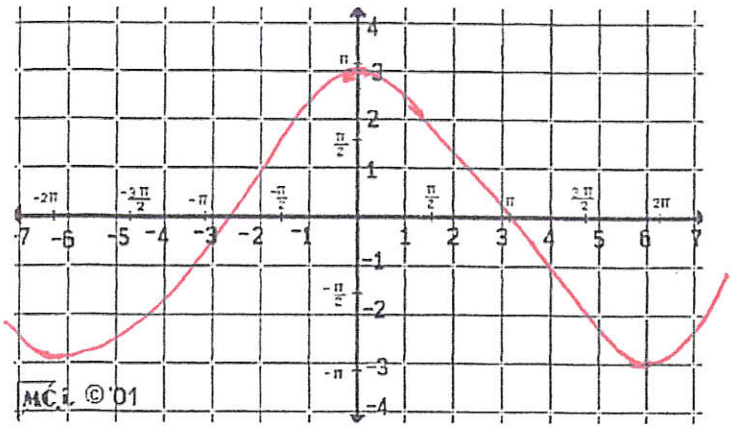
$T = \frac{2\pi}{\omega}$

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

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

$\omega = 2$

18. $y = 3\cos\frac{1}{2}x$

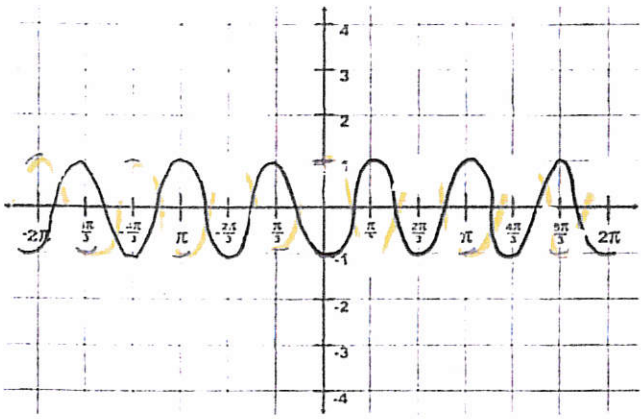


$T = \frac{2\pi}{\omega}$

Amplitude = 3

Period = 4π

19. $y = -\cos(3x)$

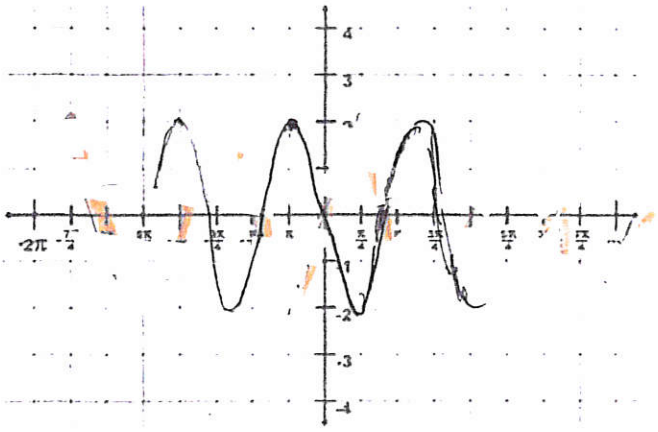


$T = \frac{2\pi}{\omega}$

Amplitude = 1

Period = $2\pi/3$

20. $y = -2\sin(2x)$



$T = \frac{2\pi}{\omega}$

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

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

Amplitude = 2

Period = π

$\omega = 2$

21. Find an equation for a sine function that has amplitude of 4, a period of π.

$y = \pm 4\sin(2x)$

$A = \pm 4$

$T = \frac{2\pi}{\omega}$

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

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

22. Find an equation for a cosine function that has an amplitude of $\frac{3}{5}$, a period of $\frac{3}{2}\pi$.

$y = \pm\frac{3}{5}\cos\left(\frac{4}{3}x\right)$

$|A| = \frac{3}{5} \Rightarrow A = \pm\frac{3}{5}$

$T = \frac{2\pi}{\omega}$

$\frac{3\pi}{2} = \frac{2\pi}{\omega}$

$\omega = \frac{2\pi}{\frac{3\pi}{2}}$

$= 2\pi \cdot \frac{2}{3\pi}$

23. Find an equation for a sine function that has amplitude of 5, a period of 3π.

$y = \pm 5\sin\left(\frac{2}{3}x\right)$

$A = \pm 5$

$T = \frac{2\pi}{\omega}$

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