Steps for graphing Sine and Cosine Functions

Using the basic sine function set-up: $y = A\sin(Bx + C)$ or $y = A\cos(Bx + C)$

1. Identify $A =$ _____ , $B =$ _____ , $C =$ _____ , $D =$ _____
2. Find the Amplitude: $|A|$
3. Find the Period: $\frac{2\pi}{B}$
4. Find the "increment": $\frac{Period}{4}$
5. Find the Phase Shift: $\frac{-C}{B}$ (*remember that this is the x_1 key point)
6. Find the 5 key points:

$$x_1 = Phase\ Shift$$
$$x_2 = x_1 + increment$$
$$x_3 = x_2 + increment$$
$$x_4 = x_3 + increment$$
$$x_5 = x_4 + increment$$

7. Identify the appropriate "pattern":

Type Fn \ Key Points	x_1	x_2	x_3	x_4	x_5
"sine"	x-intercept	Max	x-intercept	Min	x-intercept
" - sine"	x-intercept	Min	x-intercept	Max	x-intercept
"cosine"	Max	x-intercept	Min	x-intercept	max
" – cosine"	Min	x-intercept	Max	x-intercept	Min

8. Plot information on the X-Y coordinate system.
9. Vertical Shifts – use when necessary.
   *If there is a constant number tacked onto the end of the equation, then this would indicate a vertical shift. You would simply move the graph up or down the appropriate number of units.

   Ex. $y = 3\cos(2x + 1) - 5$

   Notice the "–5" tacked on the end of the function – this indicates a vertical shift – down 5 units. To graph this function you would initially ignore the "–5" at the end and use steps #1 – 8 to graph the function $y = 3\cos(2x + 1)$. After you get this graph, you would shift the graph down 5 units.

Name _____ Trigonometry

Period _____ Graphing Sine/Cosine Functions WS

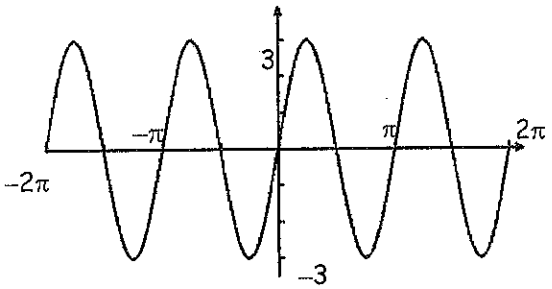
Determine the amplitude and period of each function. (Write Period in both Radian and Degree)

1. $y = \sin 4x$ **2.** $y = \cos 5x$ **3.** $y = 2 \sin x$

4. $y = -4 \sin 3x$ **5.** $y = 2 \sin (-4x)$ **6.** $y = 3 \sin \frac{2}{3}x$

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

7.



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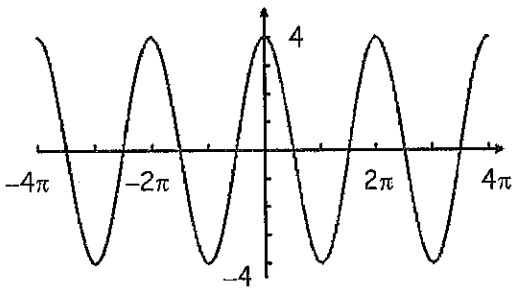

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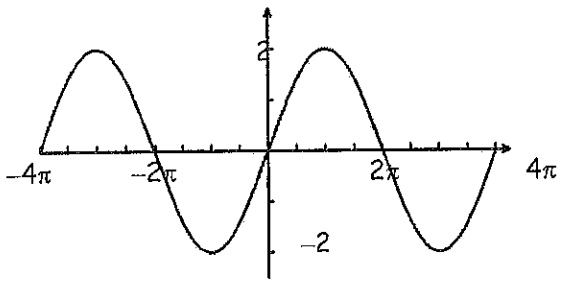

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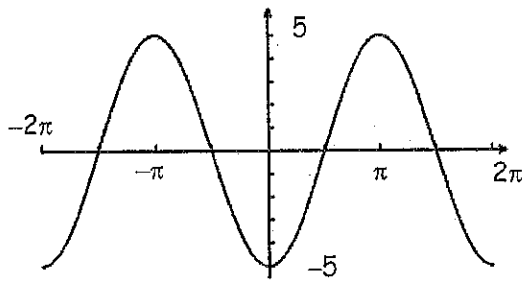
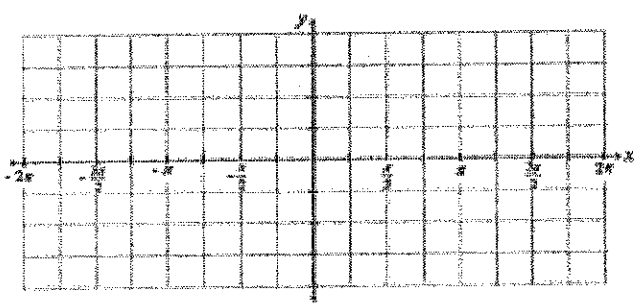
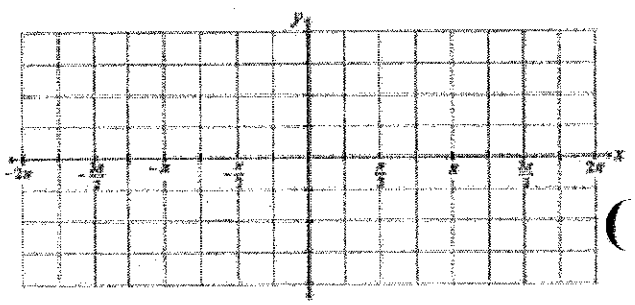


Sketch the graph of the function over the interval $-2\pi \leq x \leq 2\pi$.

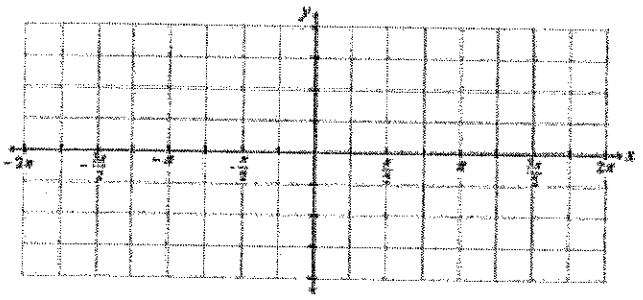
11. $y = 4 \sin x$



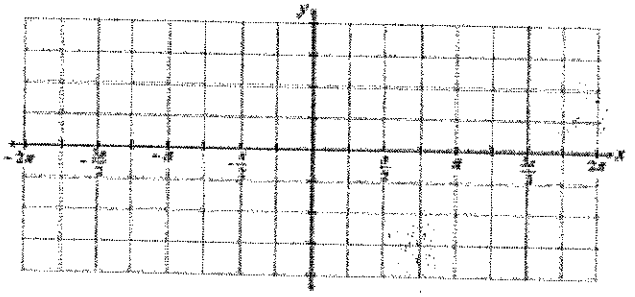
12. $y = 2 \cos x$



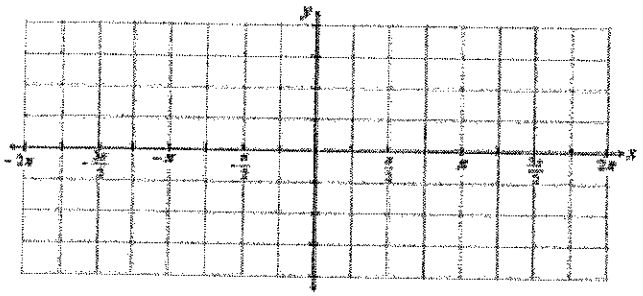
13. $y = 2 \sin 2x$



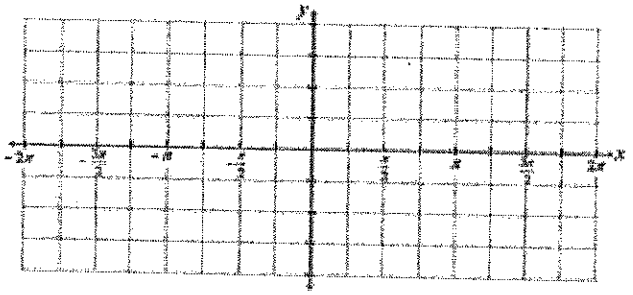
14. $y = -\cos 2x$



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



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



Determine the amplitude, period, phase shift, and vertical shift for each.

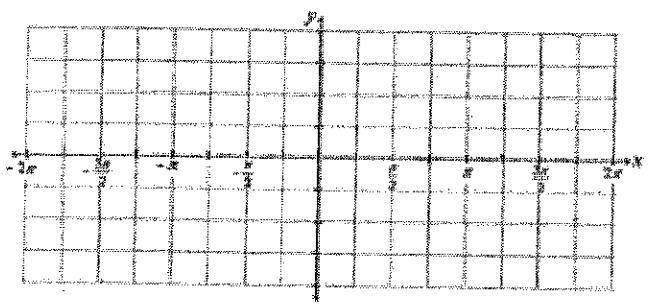
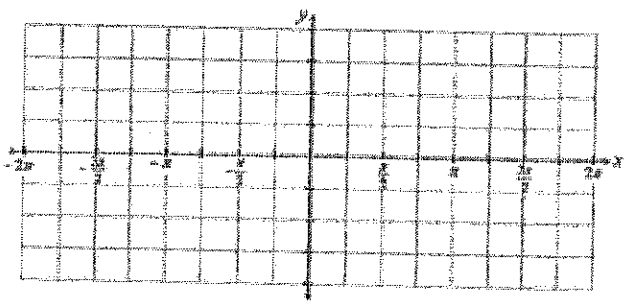
17. $y = 2 + 3\sin\left(4x + \frac{\pi}{2}\right)$

18. $y = 2 \cos (x - \pi)$

19. $y = \frac{1}{2}\cos 2x - 4$

20. $y = 3 + 4\sin(x - \pi)$

Sketch the graph of each function for **ONE PERIOD**.

21. $y = 1 + 3\sin\left(2x - \frac{\pi}{2}\right)$

22. $y = 2\cos(x + \pi) - 2$