Name: Key Class: _____ Date: _____ ID: A

Algebra 3-4 Reivew 13.1 - 13.5 F.TF.1, 3 5; F.IF.4 Severson

Find the amplitude, period, and the equation of the midline of the periodic function.

1.

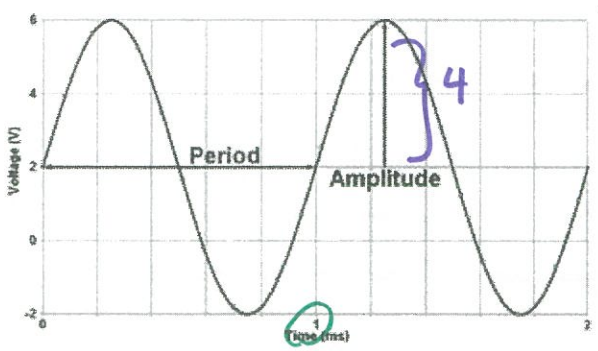
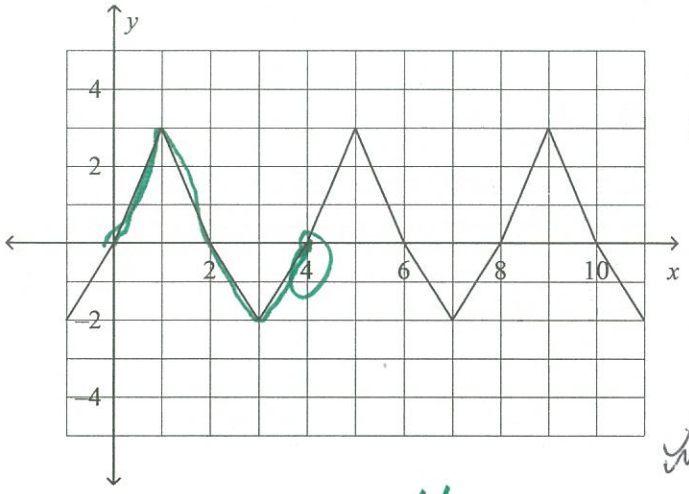


Figure 2

Amplitude: 4 Period: 1 Midline: $y = 2$

Remember: Amplitude = 1/2 (Max - Min). Midline is the average of the max and min (max + min)/2



Max = 3
Min = -2
Amp = $\frac{1}{2}(3 - (-2))$
Amp = $\frac{1}{2}(5)$
Amp = 2.5

Average Max + Min $\frac{3 + -2}{2} = \frac{1}{2}$

Amplitude: 2.5 Period: 4 Midline: $y = 1/2$

5 ↓ -3
2
? ↓ -3

____ 2. A wave has a maximum of 5. If its midline is at y = 2, what is its minimum?
a. 2 b. –3 c. 8 d. –1

____ 3. Find the measure of an angle between 0° and 360° coterminal with an angle of –271° in standard position.
a. 91° b. 271° c. 89° d. 181°

-271
+ 360

____ 4. Which of the following angles is not coterminal with the other three?
a. 591° b. 231° c. 51° d. –129°

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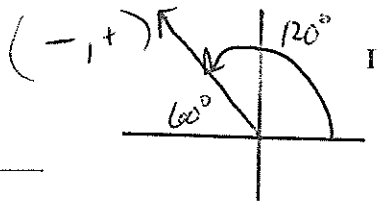
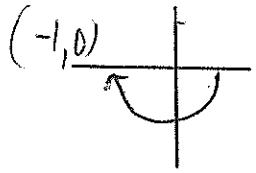
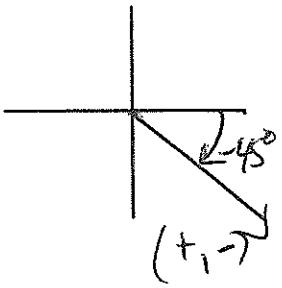
5. Sketch the angle and find the exact value of sin 120°. $+\frac{\sqrt{3}}{2}$



6. Sketch the angle and find the sine of - 180° 0

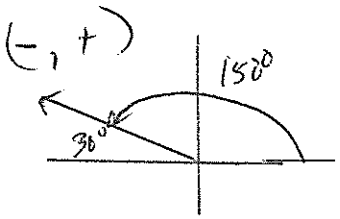


7. Sketch the angle and find the exact value of cos -45°. $+\frac{\sqrt{2}}{2}$



8. Find the exact values of cos 150° and sin 150°

cos 150° $-\frac{\sqrt{3}}{2}$ sin 150° $+\frac{\sqrt{1}}{2}$ or $\frac{1}{2}$



____ 9. Find the radian measure of an angle of 110°.

a. $\frac{11}{18\pi}$ b. $\frac{11\pi}{18}$ c. $\frac{18}{11\pi}$ d. $\frac{18\pi}{11}$

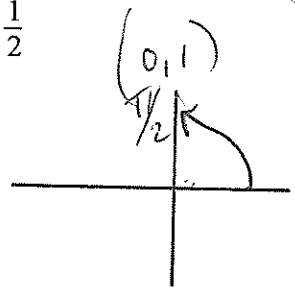
____ 10. Find the degree measure of an angle of $-\frac{\pi}{6}$ radians.

a. $-30\pi°$ b. $-\frac{\pi}{1080}°$ c. $-30°$ d. $-0.52°$

____ 11. Find the exact values of $\cos\left(\frac{3\pi}{4} \text{ radians}\right)$ and $\sin\left(\frac{3\pi}{4} \text{ radians}\right)$.

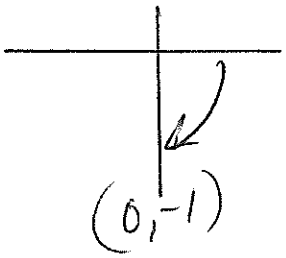
a. $\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}$ b. $-\frac{1}{2}, \frac{\sqrt{3}}{2}$ c. $-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$ d. $-\frac{\sqrt{3}}{2}, \frac{1}{2}$

____ 12. Sketch the angle and find the exact value of $\sin\left(\frac{\pi}{2} \text{ radians}\right)$.



a. $\frac{1}{2}$ b. 1 c. $\frac{\sqrt{3}}{2}$ d. $\frac{\sqrt{2}}{2}$

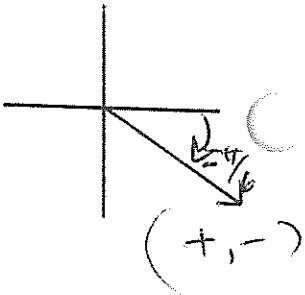
____ 13. Sketch the angle and find the exact value of $\sin\left(-\frac{\pi}{2} \text{ radians}\right)$.



a. $-\frac{\sqrt{3}}{2}$ b. $-\frac{\sqrt{2}}{2}$ c. -1 d. $-\frac{1}{2}$

____ 14. Sketch the angle and find the exact value of $\cos\left(-\frac{\pi}{6} \text{ radians}\right)$.

a. $\frac{\sqrt{2}}{2}$ b. $-\frac{1}{2}$ c. $\frac{1}{2}$ d. $\frac{\sqrt{3}}{2}$



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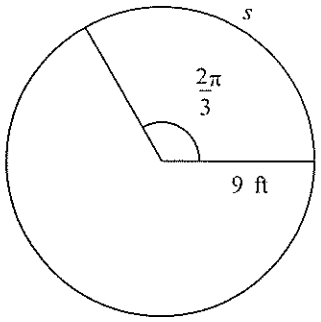
Use the given circle. Find the length s to the nearest tenth. $S = r\theta$

15. $r = 9$ θ = angle in radians



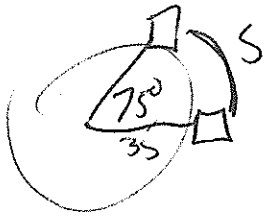
$S = 9\left(\frac{2\pi}{3}\right) = 6\pi$

$S \approx 18.8$ feet

16. A Ferris wheel has a radius of 35 feet. Two particular cars are located such that the central angle between them is 75°. To the nearest tenth, what is the length of the intercepted arc between those two cars on the Ferris wheel? Show the work that leads to your answer.

$r = 35$

$\theta = 75^\circ \cdot \frac{\pi}{180^\circ}$ rad



$\theta = \frac{75\pi}{180}$

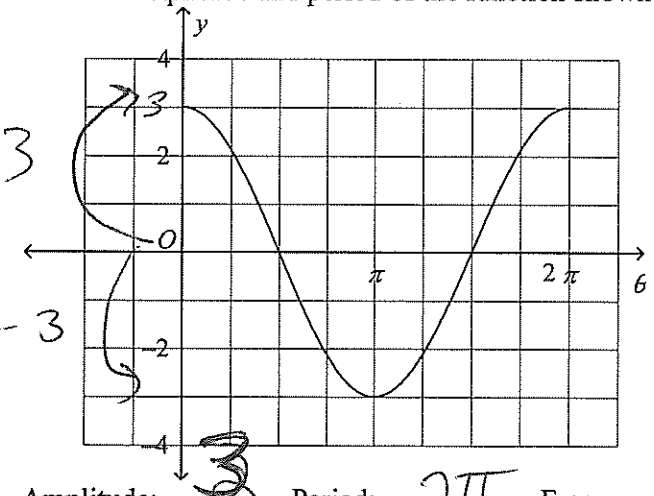
$S = 35\left(\frac{75\pi}{180}\right)$

$S \approx 45.8$ feet

17. Given $y = -3\cos\frac{x}{4}$ find the amplitude and period of the function.

Amplitude: 3 Frequency: $\frac{1}{4}$ Period: 8π $\leftarrow \frac{2\pi}{(\frac{1}{4})}$

18. Find the amplitude and period of the function shown below. Then write an equation for the given graph.



3

-3

cosine graph

$y = a\cos bx$

Amplitude: 3 Period: 2π Frequency: 1 Equation: $y = 3\cos x$

"a" "b"

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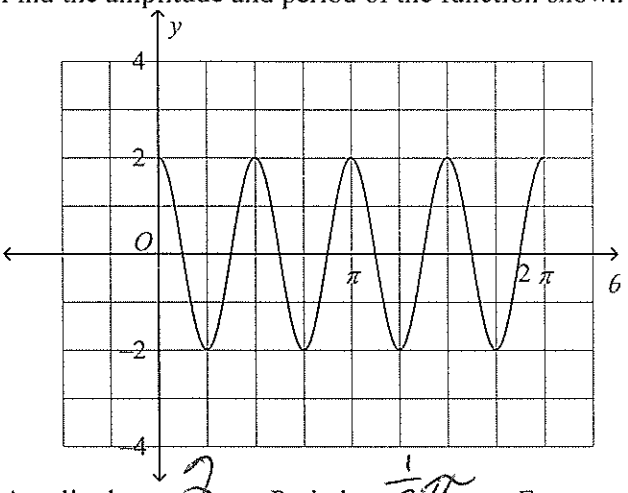
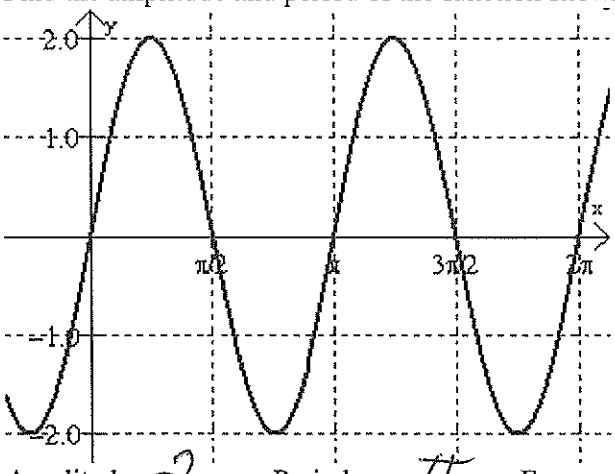
19. Find the amplitude and period of the function shown below. Then write an equation for the given graph.



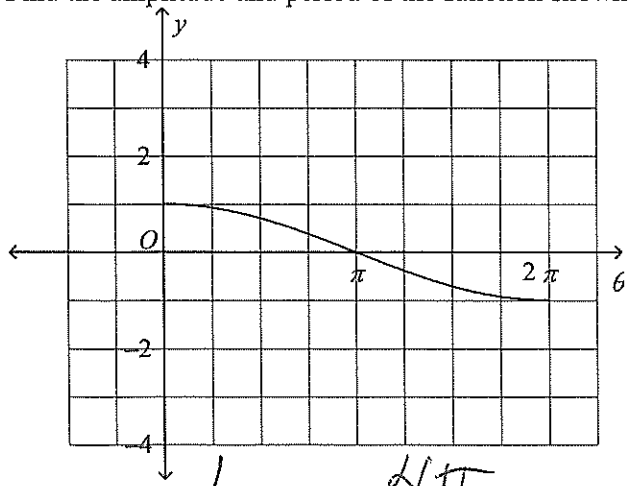
Amplitude: 2 Period: $\frac{1}{2}\pi$ Frequency: 4 Equation: $y = 2\cos 4x$

20. Find the amplitude and period of the function shown below. Then write an equation for the given graph.



Amplitude: 2 Period: π Frequency: 2 Equation: $y = 2\sin 2x$

21. Find the amplitude and period of the function shown below. Then write an equation for the given graph.



Amplitude: 1 Period: 4π Frequency: $1/2$ Equation: $y = 1\cos\left(\frac{1}{2}x\right)$

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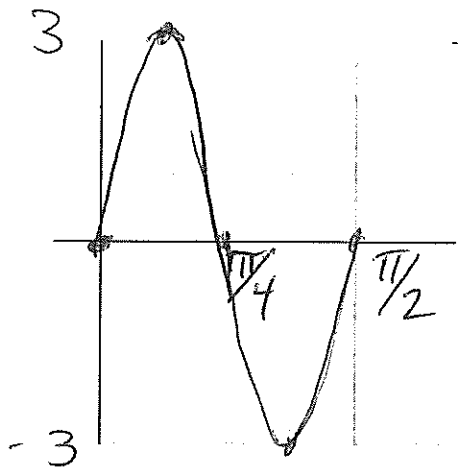
22. Sketch the graph of one cycle of a sine curve with amplitude 3, period $\frac{1}{2}\pi$, and $a > 0$. Label the axes!

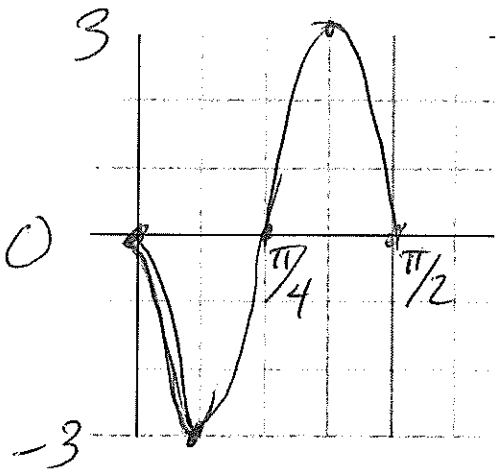
Start at (0, 0)



Sketch one cycle of the sine curve.

23. $y = -3 \sin 4\theta$

Amplitude: 3 Frequency: 4 Period: $\frac{2\pi}{4} \rightarrow \frac{1}{2}\pi$ Label the axes!



Since "a" is negative go to the low point first!

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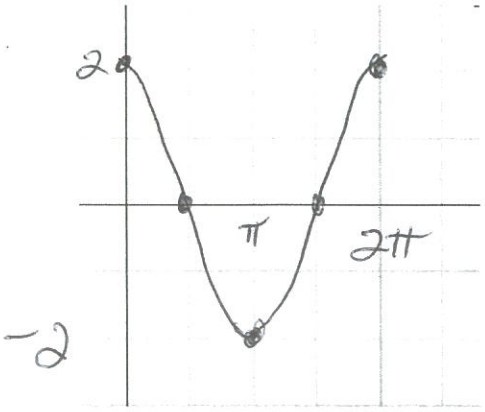
Sketch one cycle of the cosine function.

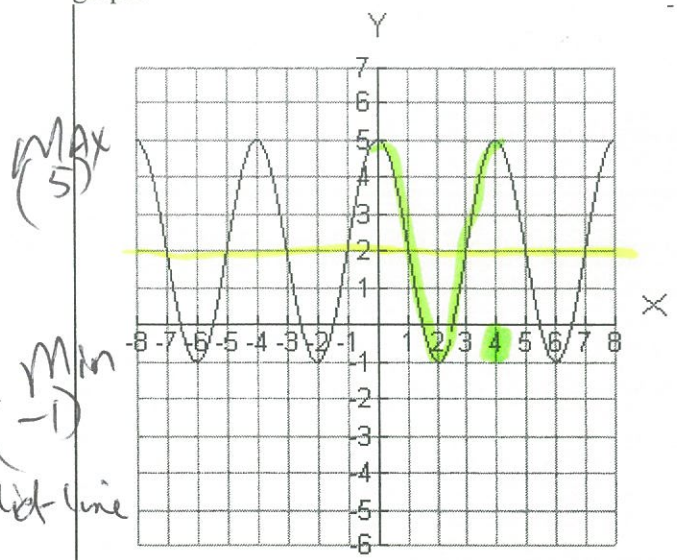
24. $y = 2\cos\theta$

Amplitude: 2 "b" Frequency: 1 Period: $\frac{2\pi}{1}$ or 2π Label the axes!

Cosine: Start at the "a" value



25. Find the amplitude, period, and mid-line of the function shown below. Then write an equation for the given graph.



Since $y=0$ is not the mid-line start by finding the Midline: $\frac{5+-1}{2} \rightarrow \frac{4}{2} = 2$

Amplitude: 3 Period: 4 Mid-line: $y=2$

Equation: $y = 3\cos\left(\frac{\pi}{2}x\right) + 2$

Always add the mid-line. This is the vertical shift.

Cosine

Need "b" so $b = \frac{2\pi}{per.}$ $b = \frac{2\pi}{4}$ $b = \frac{\pi}{2}$

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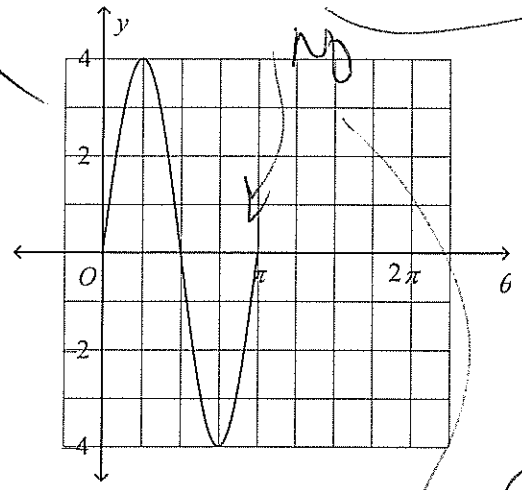
What is the graph of one cycle of a sine curve with the given characteristics? Using the form $y = a \sin b\theta$, what is an equation for the sine curve?

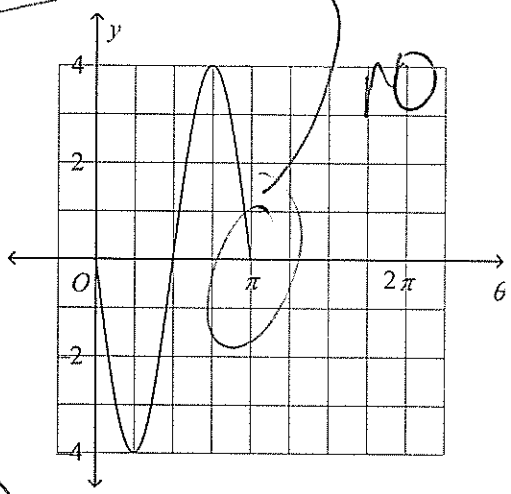
26. amplitude = 4, period = 2π, midline $y = 0$, and $a > 0$

a.



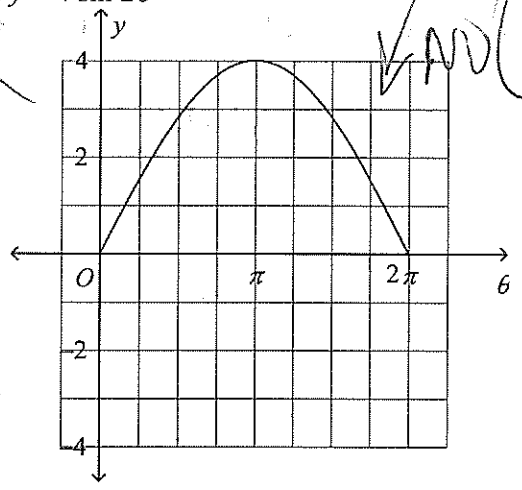
$y = 4 \sin 2\theta$

c.



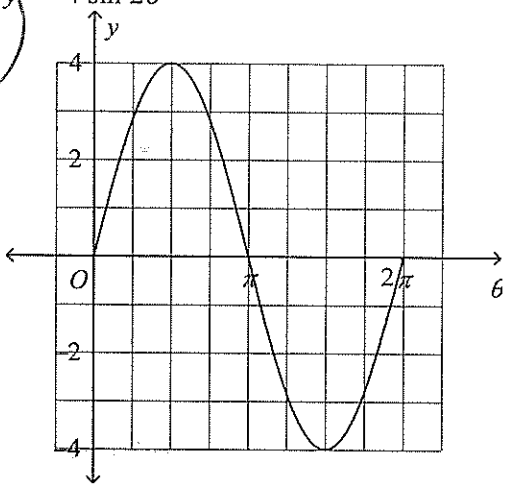
$y = -4 \sin 2\theta$

b.



$y = 4 \sin \frac{1}{2}\theta$

d.



$y = 4 \sin \theta$

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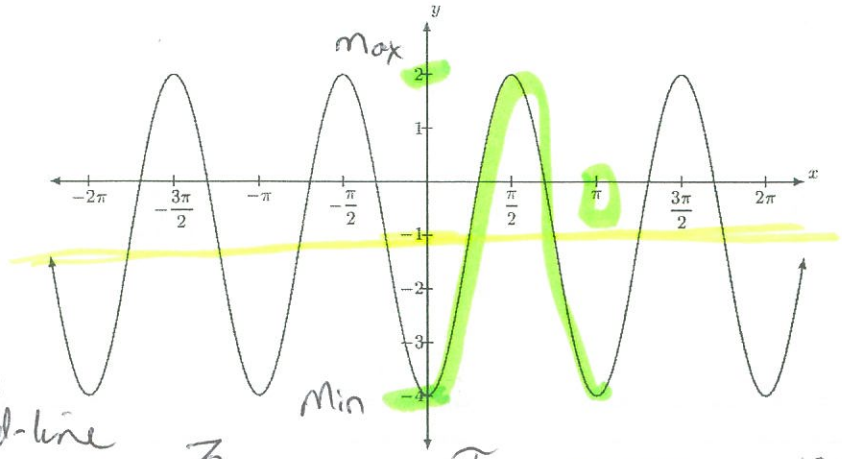
27. Find the amplitude, period, and mid-line of the graph shown below. Then write the equation for the graph.



y = 0 Not in the middle - find the mid-line

Mid: $\frac{2+-4}{2} \Rightarrow \frac{-2}{2} = -1$

-4

Max - Mid-line

2 - (-1)

Amplitude: 3 Period: π Mid-line: $y = -1$

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

Equation: $y = -3\cos(2x) + -1$ OR $y = -3\cos(2x) - 1$

KEY POINTS OF THE SINE AND COSINE GRAPHS