

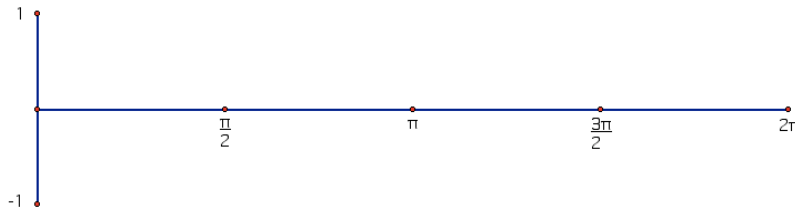
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**Topic 1: Basics of radians**

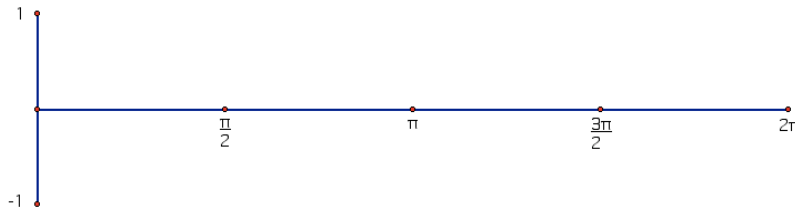
1. Convert the following to radians: 225 degrees 150 degrees
2. Convert the following to degrees:  $\frac{5\pi}{6}$   $\frac{11\pi}{12}$
3. Express  $32\pi/5$  as a radian measure between 0 and  $2\pi$

**Topic 2: Graphing Sine and Cosine – Calculator Allowed**

4. Graph the Sine Function in detail:



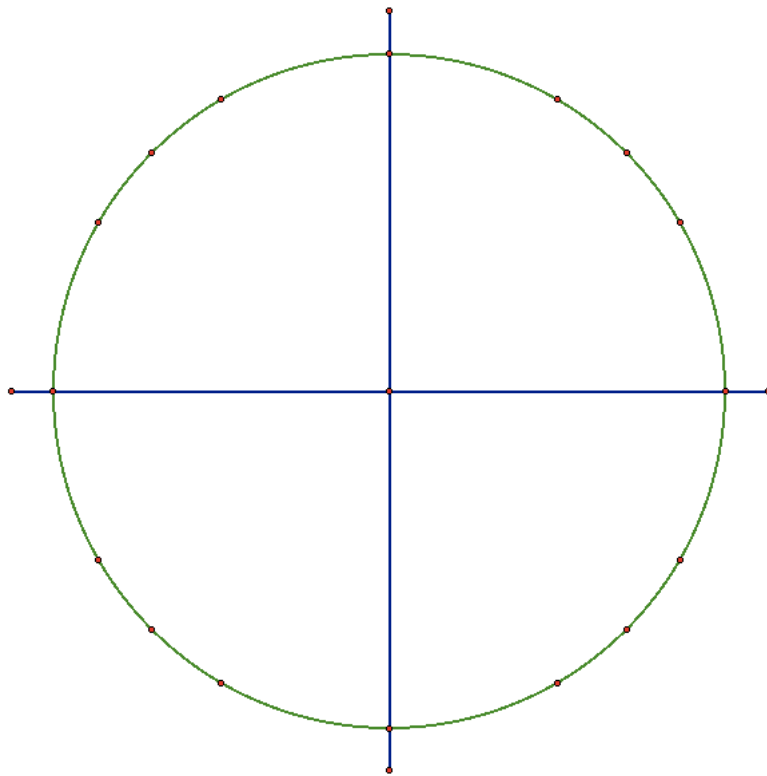
5. Graph the Cosine Function in detail:



6. State the amplitude, period, and vertical shift for  $y = 3 \sin (2x) + 4$
7. State the equation of the sine curve that has amplitude 3, vertical shift -2, and period  $4\pi$
8. Graph the equation described in question 7.
9. The equation  $y = 43 + 31\sin\left[\frac{\pi}{6}(t - 4)\right]$  models the temperature for Minneapolis. In this equation,  $t$  denotes the number of months with January represented by 1. What is the difference between the average monthly temperatures for July and January?

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**Topic 3: The unit Circle** – state the angle measure, RADIAN, and ordered pairs in the unit circle.



10-12. Find the following ratios:

$$\sin \frac{\pi}{3}$$

$$\tan \left( \frac{-3\pi}{4} \right)$$

$$\csc \left( \frac{-5\pi}{4} \right)$$

**Topic 4: Trig Graphing – No Calculator**

13. State the equation of the cosine curve that has amplitude 2, vertical shift 1, and period  $\pi$ .

Graph the following

14.  $y = 2 \sin(x) - 1$

15.  $y = 3 \sin(2x) + 2$

16.  $y = -\cos(x) - 1$

17.  $y = 4 \cos(4x) + 2$

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Topic 1: Basics of radians

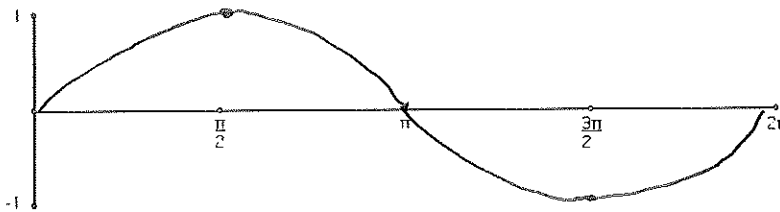
- Convert the following to radians: 225 degrees  $\frac{5\pi}{4}$   
 $\frac{225}{360} = \frac{x}{2\pi}$       150 degrees  $\frac{5\pi}{6}$
- Convert the following to degrees:  $\frac{5\pi}{6} = 150$        $\frac{11\pi}{12} = 165$        $\frac{x}{360} = \frac{11\pi}{2\pi}$

3. Express  $32\pi/5$  as a radian measure between 0 and  $2\pi$

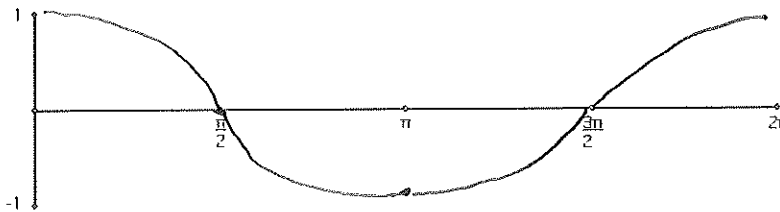
subtract  $\frac{10\pi}{5}$   $\frac{2\pi}{5}$

Topic 2: Graphing Sine and Cosine – Calculator Allowed

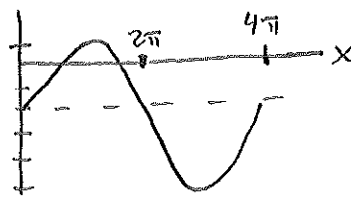
4. Graph the Sine Function in detail:



5. Graph the Cosine Function in detail:



- State the amplitude, period, and vertical shift for  $y = 3 \sin(2x) + 4$   
 3       $\pi$       4       $\frac{2\pi}{2} = \pi$
- State the equation of the sine curve that has amplitude 3, vertical shift -2, and period  $4\pi$   
 $y = 3 \sin(\frac{1}{2}x) - 2$        $\frac{4\pi}{1} = \frac{2\pi}{K}$        $K = \frac{1}{2}$
- Graph the equation described in question 7.

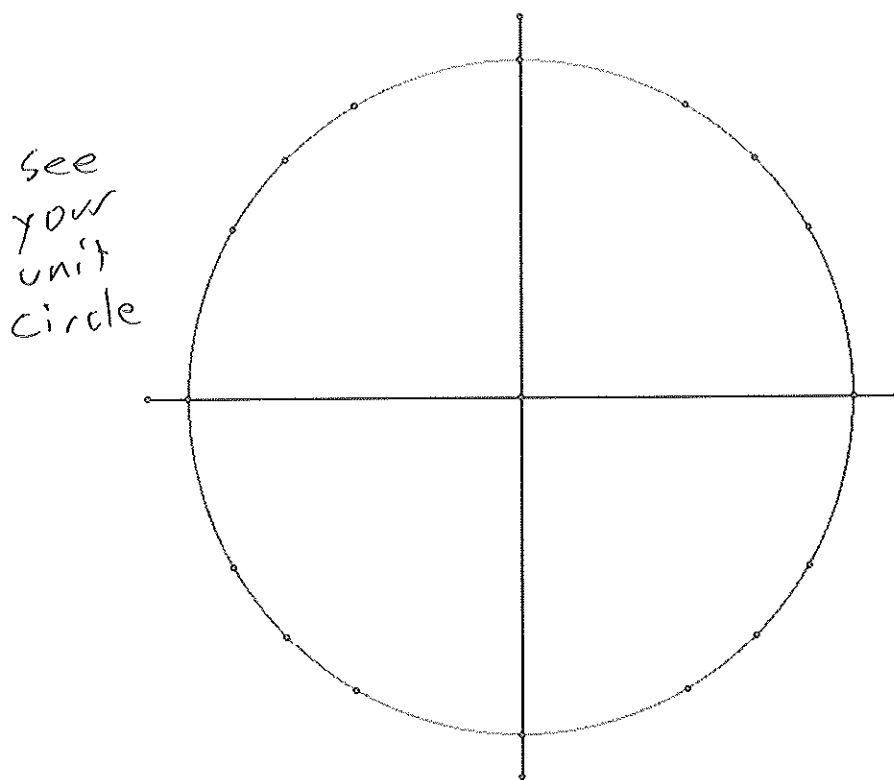


9. The equation  $y = 43 + 31 \sin\left[\frac{\pi}{6}(t - 4)\right]$  models the temperature for Minneapolis. In this equation,  $t$  denotes the number of months with January represented by 1. What is the difference between the average monthly temperatures for July and January?

$\begin{matrix} 7 \\ \downarrow \\ 74^\circ \end{matrix}$ 
     
  $\begin{matrix} 1 \\ \downarrow \\ 12^\circ \end{matrix}$ 
     
  $74 - 12 = 62^\circ$

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Topic 3: The unit Circle – state the angle measure, RADIAN, and ordered pairs in the unit circle.



10-12. Find the following ratios:

$$\sin \frac{\pi}{3} \quad \frac{\sqrt{3}}{2}$$

$$\tan \left( \frac{-3\pi}{4} \right) = 1$$

$$\csc \left( \frac{-5\pi}{4} \right) = \frac{1}{\sin \left( \frac{-5\pi}{4} \right)} = \frac{1}{\frac{\sqrt{2}}{2}} = \sqrt{2}$$

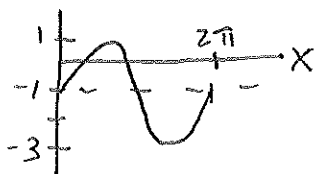
13. State the equation of the cosine curve that has amplitude 2, vertical shift 1, and period  $\pi$ .

$$y = 2 \cos(2x) + 1$$

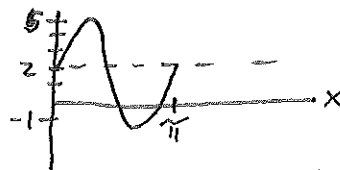
Topic 4: Trig Graphing – No Calculator

Graph the following

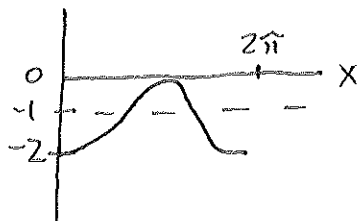
14.  $y = 2 \sin(x) - 1$



15.  $y = 3 \sin(2x) + 2$  - period =  $\pi$



16.  $y = -\cos(x) - 1$



17.  $y = 4 \cos(4x) + 2$  - period =  $\frac{\pi}{2}$

