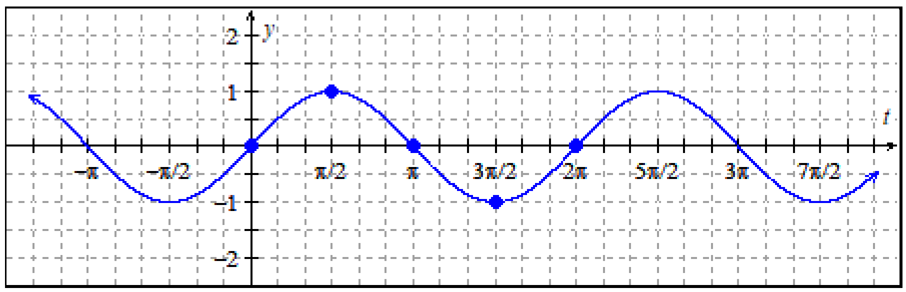
Practice Worksheet: Graphs of Trig Functions

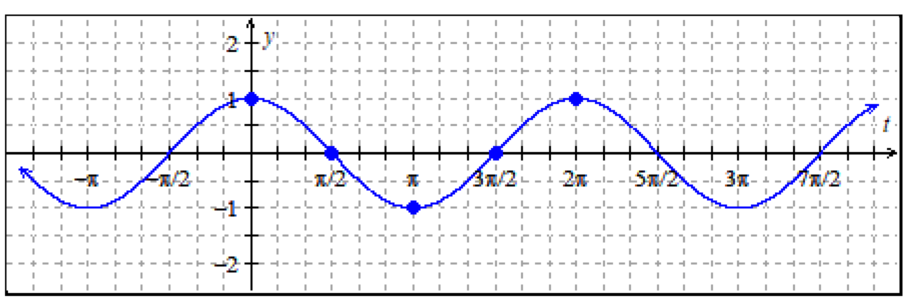
You should complete all of these problems ***without a calculator*** in order to prepare for the Midterm which is a no-calculator exam.

1. The graph of $y = \sin(t)$ is given below with **five key points** emphasized. As we know, the graph of $f(t) = \sin\left(t - \frac{2\pi}{3}\right) + 1$ is a *transformation* of $y = \sin(t)$. Use what we know about graph transformations from MTH 111 to "transform" the **five key points** on $y = \sin(t)$ and then connect these points in order to construct a graph of $y = f(t)$.



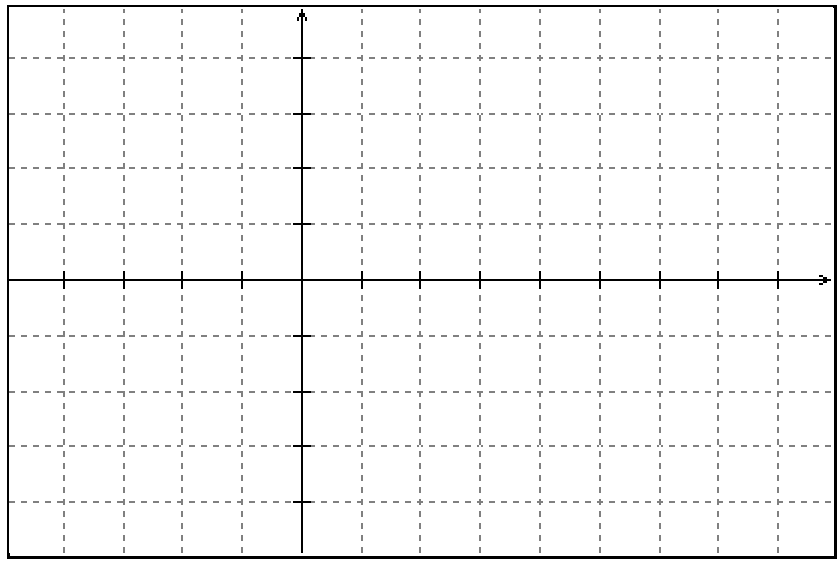
A graph of $y = \sin(t)$ is given; draw a graph of $f(t) = \sin\left(t - \frac{\pi}{6}\right) + 1$.

2. The graph of $y = \cos(t)$ is given below with **five key points** emphasized. As we know, the graph of $g(t) = 2\cos\left(t + \frac{5\pi}{6}\right)$ is a *transformation* of $y = \cos(t)$. Use what we know about graph transformations from MTH 111 to "transform" the **five key points** on $y = \cos(t)$ and then connect these points in order to construct a graph of $y = g(t)$.



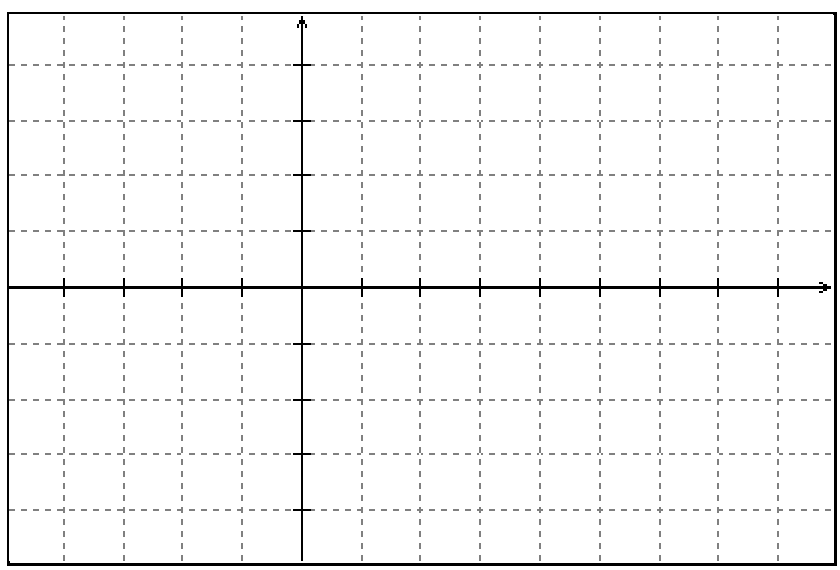
A graph of $y = \cos(t)$ is given; draw a graph of $g(t) = 2\cos\left(t + \frac{5\pi}{6}\right)$.

3. Scale the axes on the given coordinate plane an appropriately for a graph of $y = \sin(2t) + 3$ and then draw a graph of $y = \sin(2t) + 3$ by first plotting the points where the graph will intersect the midline and the points where the graph will reach maximum and minimum values, and then connect these points with an appropriately curved sinusoidal wave.



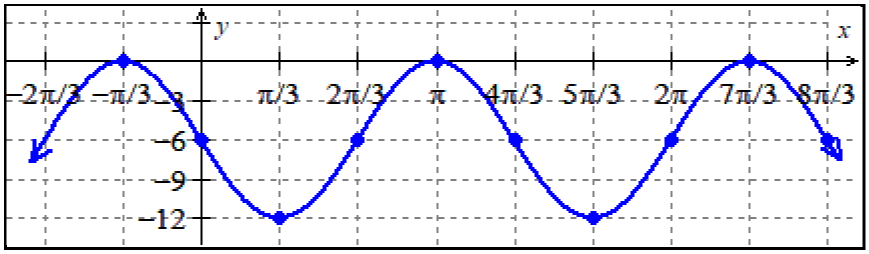
Draw a graph of $y = \sin(2t) + 3$.

4. Scale the axes on the given coordinate plane an appropriately for a graph of $y = 3\cos(\pi t)$ and then draw a graph of $y = 3\cos(\pi t)$ by first plotting the points where the graph will intersect the midline and the points where the graph will reach maximum and minimum values, and then connect these points with an appropriately curved sinusoidal wave.



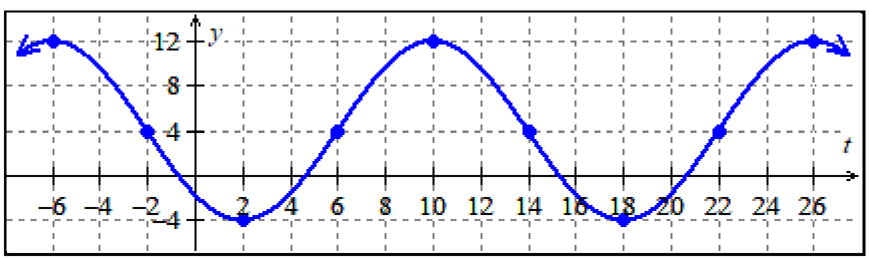
Draw a graph of $y = 3\cos(\pi t)$.

5. Find two different algebraic rules for the sinusoidal function $y = p(x)$ graphed below. One of your rules should involve sine and the other should involve cosine.



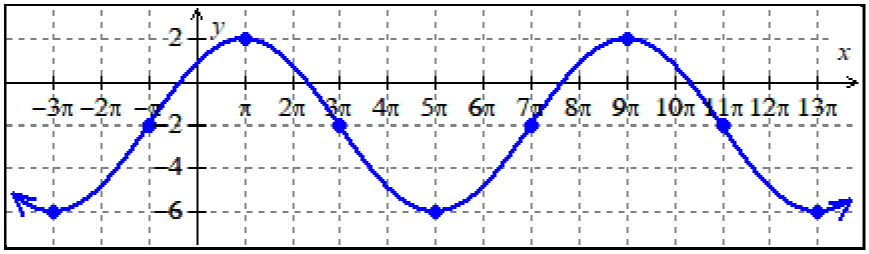
A graph of $y = p(x)$.

6. Find two different algebraic rules for the sinusoidal function $y = q(t)$ graphed below. One of your rules should involve sine and the other should involve cosine.



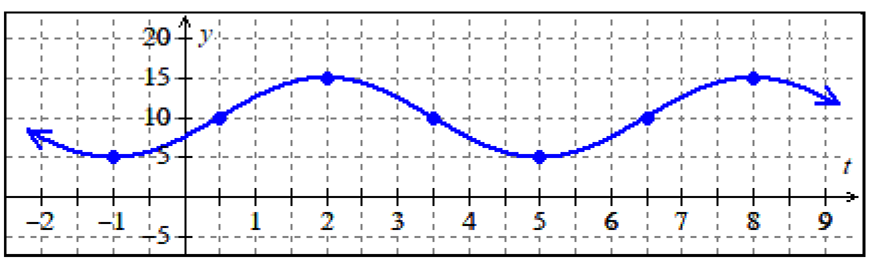
A graph of $y = q(t)$.

7. Find two different algebraic rules for the sinusoidal function $y = m(x)$ graphed below. One of your rules should involve sine and the other should involve cosine.



A graph of $y = m(x)$.

8. Find two different algebraic rules for the sinusoidal function $y = n(t)$ graphed below. One of your rules should involve sine and the other should involve cosine.



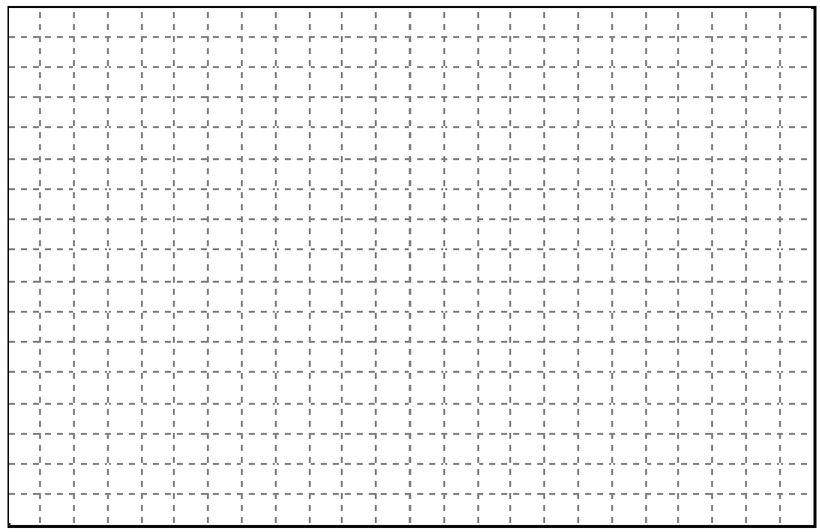
A graph of $y = n(t)$.

9. Draw a graph of at least two periods of the functions in **a–f** below by first *plotting the points* where the graph will intersect the midline and *plotting the points* where the graph will reach maximum and minimum values, and then *connect these points* with an appropriately curved sinusoidal wave. List the period, midline, and amplitude of each function. (Be sure to label the scale on the axes of your graph.)

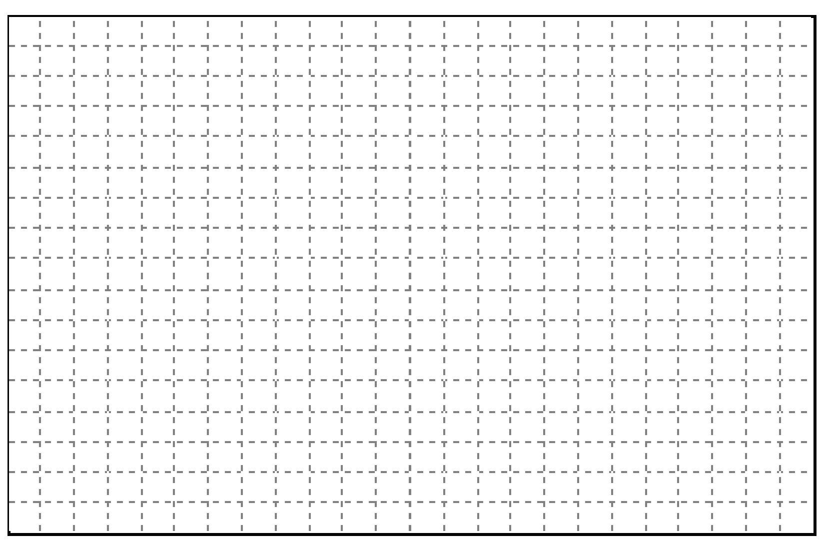
a. $f(t) = -5\cos(4t) + 3$

b. $g(x) = 4\sin\left(\pi\left(x - \frac{1}{4}\right)\right) - 2$

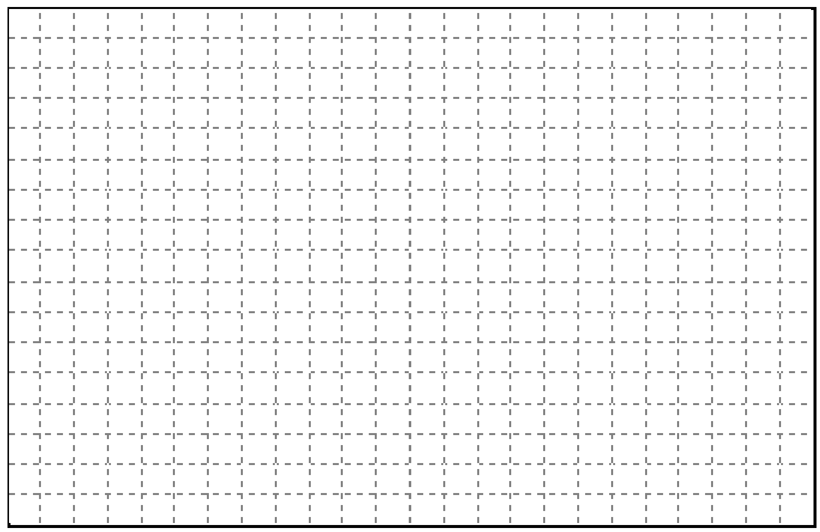
c. $G(x) = 3\cos\left(2x + \frac{\pi}{2}\right) + 4$



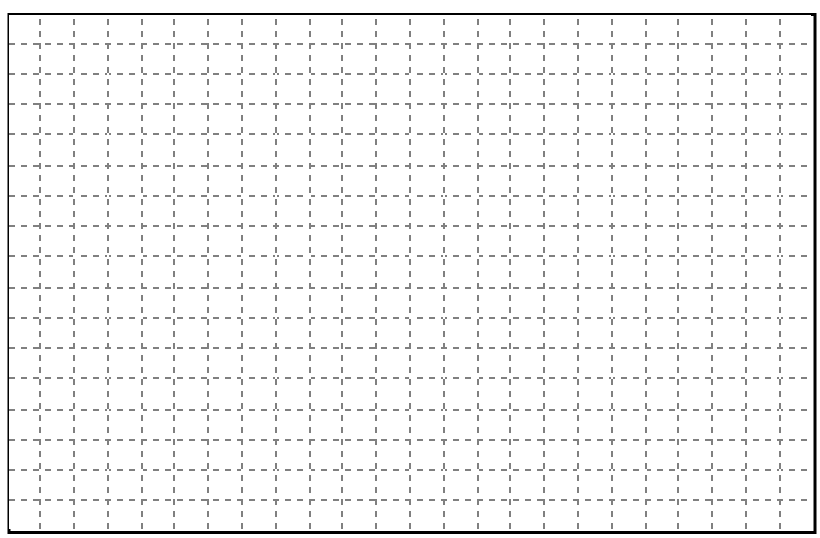
d. $F(t) = -2\sin\left(\frac{\pi}{3}t + \pi\right) - 1$



e. $p(x) = 10\cos\left(\dfrac{x + 2\pi}{4}\right) - 5$



f. $q(t) = -4\sin\left(\frac{\pi}{4}t - \frac{\pi}{4}\right) - 2$



10. Describe the values that are **not** in the domain of $y = \tan(t)$.

11. Describe the values that are **not** in the domain of $y = \sec(t)$.

12. Describe the values that are **not** in the domain of $y = \cot(t)$.

13. Describe the values that are **not** in the domain of $y = \csc(t)$.