

Trigonometry Chapter 4

Section 1

I. Vocabulary

Complete each statement:

1. The AMPLITUDE of the graph of the function $f(x) = \sin(x)$ is _____.
2. The STANDARD INTERVAL of the graph of the function $f(x) = \cos(x)$ is _____.
3. The PERIOD of the graph of the function $f(x) = \sin(x)$ is _____.
4. The RANGE of the graph of the function $f(x) = \cos(x)$ is _____.
5. The DOMAIN of the graph of the function $f(x) = \sin(x)$ is _____.
6. The GRAPH of the function $f(x) = \sin(x)$ is _____.
7. The GRAPH of the function $f(x) = \cos(x)$ is _____.
8. The GRAPH of the function $f(x) = -\sin(x)$ is _____.
9. The GRAPH of the function $f(x) = -\cos(x)$ is _____.

II. The BASIC QUADRANTAL EQUATIONS (solve in the interval $[0, 2\pi)$) are:

10. $\sin(x) = 0 \Rightarrow x = \underline{\hspace{1cm}}, x = \underline{\hspace{1cm}}$
11. $\sin(x) = 1 \Rightarrow x = \underline{\hspace{1cm}}$
12. $\sin(x) = -1 \Rightarrow x = \underline{\hspace{1cm}}$
13. $\cos(x) = 0 \Rightarrow x = \underline{\hspace{1cm}}, x = \underline{\hspace{1cm}}$
14. $\cos(x) = 1 \Rightarrow x = \underline{\hspace{1cm}}$
15. $\cos(x) = -1 \Rightarrow x = \underline{\hspace{1cm}}$

III. Match each function with its one-period graph. Note that not all graphs will be used.

16. ____ $f(x) = -\sin(x)$

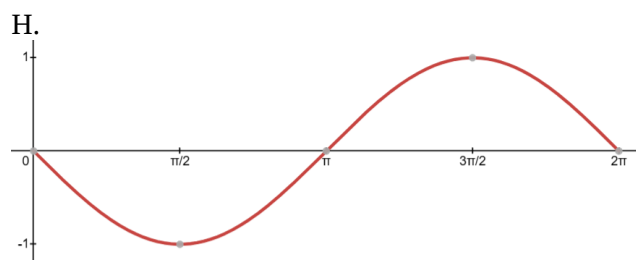
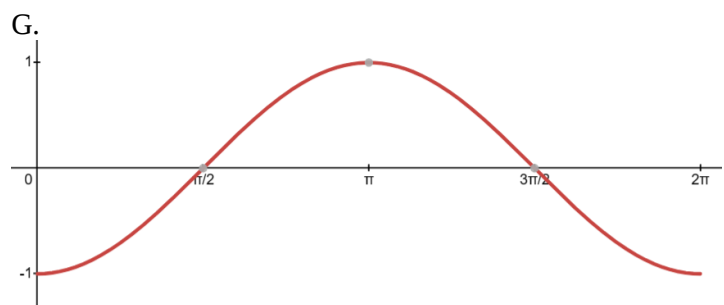
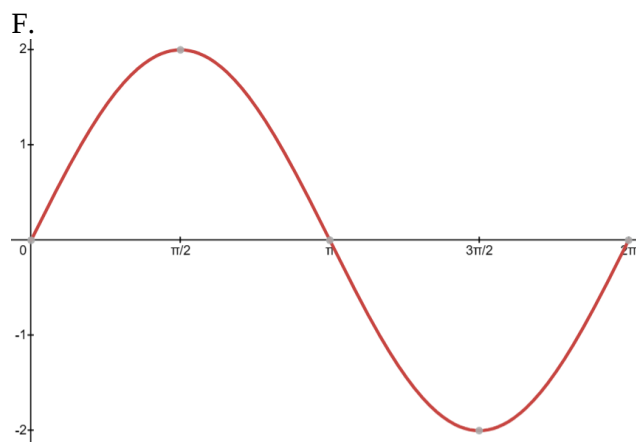
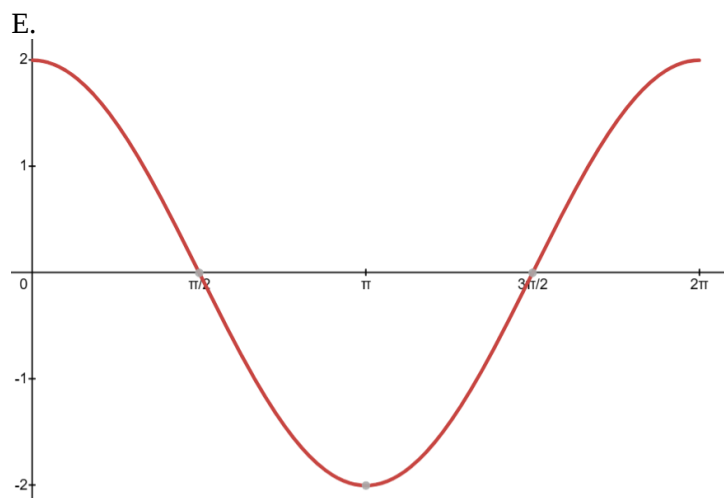
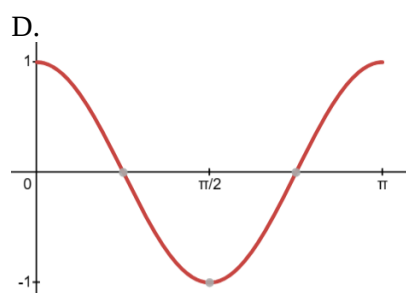
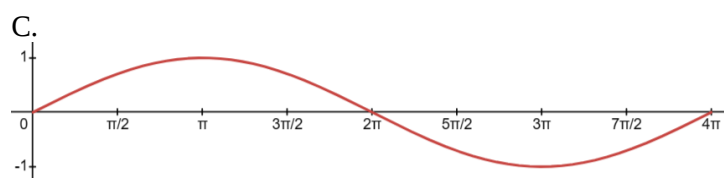
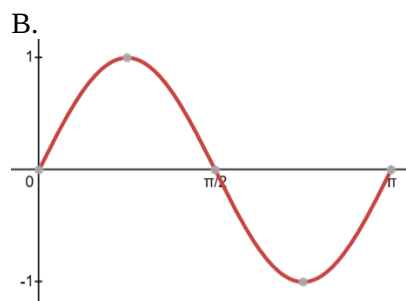
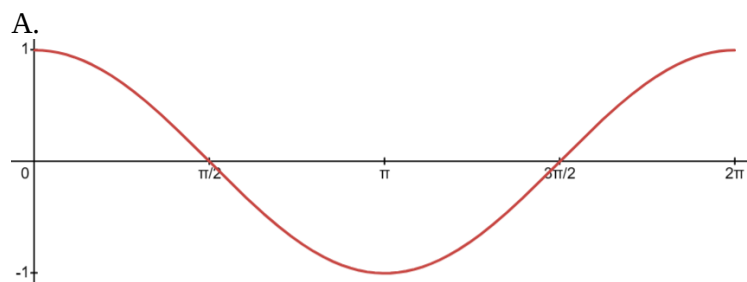
17. ____ $f(x) = 2 \cos(x)$

18. ____ $f(x) = \sin(\frac{1}{2}x)$

19. ____ $f(x) = \cos(2x)$

20. ____ $f(x) = 2 \sin(x)$

21. ____ $f(x) = -\cos(x)$



III. Graph the standard period of each function, as demonstrated in class.

Example:

a) $f(x) = -\cos(\frac{1}{2}x)$

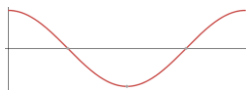
b) $f(x) = 3\sin(x)$

c) $f(x) = -2\sin(2x)$

Solution:

a) $f(x) = -\cos(\frac{1}{2}x)$

Basic shape:



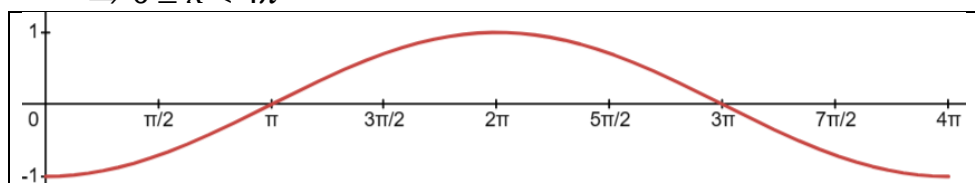
Amplitude: $|-1| = 1$

Standard Interval: $0 \leq \frac{1}{2}x < 2\pi$

$$\Rightarrow 2 \cdot (0 \leq \frac{1}{2}x < 2\pi)$$

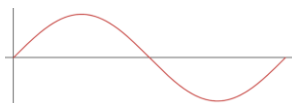
$$\Rightarrow 0 \leq x < 4\pi$$

So we have:



b) $f(x) = 3\sin(x)$

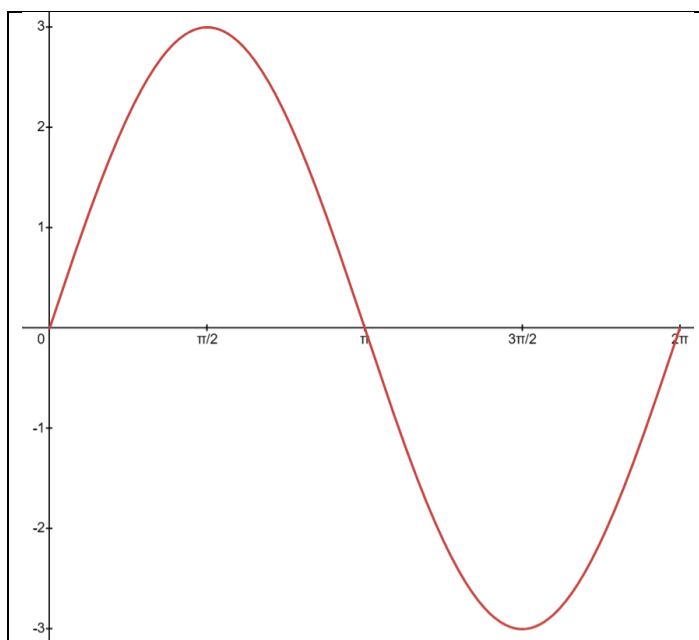
Basic shape:



Amplitude: $|3| = 3$

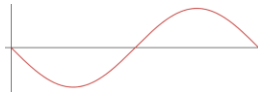
Standard Interval: $0 \leq x < 2\pi$

So we have:



c) $f(x) = -2\sin(2x)$

Basic shape:



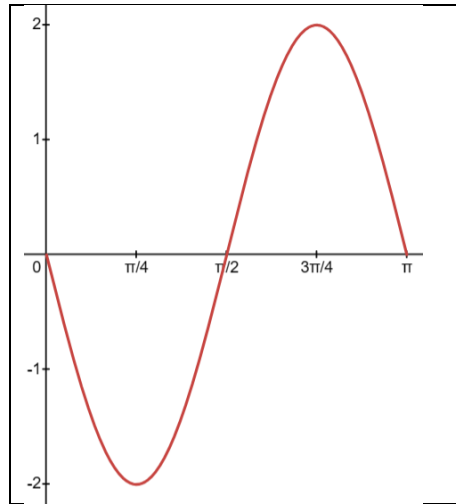
Amplitude: $|-2| = 2$

Standard Interval: $0 \leq 2x < 2\pi$

$$\Rightarrow \frac{1}{2} \cdot (0 \leq 2x < 2\pi)$$

$$\Rightarrow 0 \leq x < \pi$$

So we have:



22. $f(x) = -\sin(2x)$

22. $f(x) = 3\sin(x)$

22. $f(x) = 2\cos(2x)$

22. $f(x) = -\frac{1}{2}\cos(2x)$

22. $f(x) = 3\sin(4x)$

22. $f(x) = \frac{1}{2}\sin(\frac{1}{2}x)$

22. $f(x) = -5\cos(x)$

22. $f(x) = \cos(2x)$

22. $f(x) = -2\sin(x)$