

AP Calculus AB Chapter 0 Review Problems

1. Write the function as a piecewise function:

a. $f(x) = |2x + 1|$

b. $f(x) = |x^3 + 3x^2 - 10x|$

2. Find the domain of the function

a. $f(x) = \sqrt{x^2 - 16}$

b. $f(x) = \sqrt{-3x + 5}$

c. $\frac{3x}{\cos(x)}$

3. Find the value of each of the following:

a. $\cos\left(\frac{7\pi}{6}\right)$

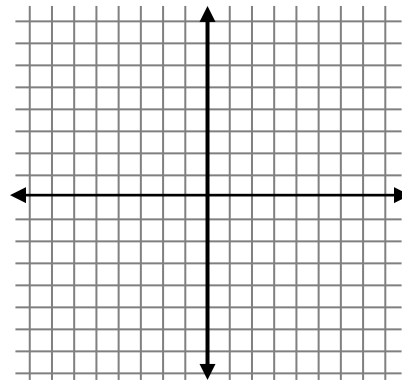
b. $\tan\left(\frac{2\pi}{3}\right)$

c. $\sin(\pi)$

d. $\cos\left(\frac{-4\pi}{3}\right)$

4. Sketch a graph of the following piecewise function:

$$f(x) = \begin{cases} 3 & \text{if } x \leq -2 \\ \frac{1}{2}x^2 + 1 & \text{if } -2 < x < 2 \\ \frac{1}{2}x - 1 & \text{if } x \geq 2 \end{cases}$$



5. Given $f(x) = -x + 5$ and $g(x) = x^2 + 3$

a. Find $g(f(x))$

b. Find $f(g(2))$

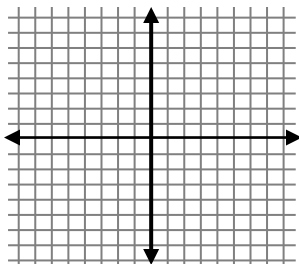
6. Use a sign pattern to determine intervals where the function is positive and intervals where the function is negative. $f(x) = \frac{-x^2 + 4x}{x^2 - 2x - 3}$

7. Solve for y in terms of x (get y by itself)

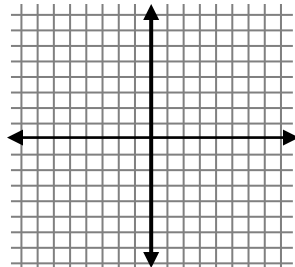
$$6y + 3x - 5x^2 = 7xy - 2y$$

8. Sketch a graph of each function:

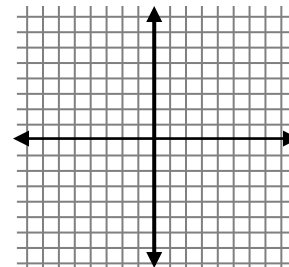
a. $f(x) = e^{x-3} + 2$



b. $f(x) = \ln(x + 4)$



c. $f(x) = -\sqrt{x + 1} - 3$



9. Solve for x on the interval $[0, 2\pi)$

$$2 \sin^2 x + 3 \sin x + 1 = 0$$

Practice:

1. Write the function as a piecewise function: $f(x) = |2x^2 - 7x - 15|$

2. Find the domain of the function $f(x) = \ln(-x^2 + 5x)$

3. Find the value of each of the following:

a. $\cos\left(\frac{7\pi}{4}\right)$

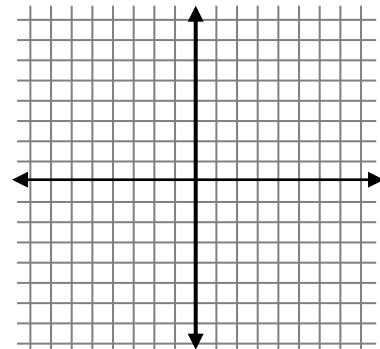
b. $\tan\left(\frac{\pi}{2}\right)$

c. $\cos\left(\frac{-7\pi}{6}\right)$

d. $\sin\left(\frac{4\pi}{3}\right)$

4. Sketch a graph of the following piecewise function:

$$f(x) = \begin{cases} 2x + 3 & \text{if } x \leq -2 \\ \sqrt{x + 2} & \text{if } -2 < x < 2 \\ \frac{1}{2}(x - 4)^2 & \text{if } x \geq 2 \end{cases}$$



5. Given $f(x) = \sqrt{3x}$ and $g(x) = x^2 + 8x + 3$

a. Find $g(f(x))$

b. Find $f(g(1))$

6. Use a sign pattern to determine intervals where the function is positive and intervals where the function is negative.

$$f(x) = \frac{-x^3 + x^2 + 20x}{x - 2}$$

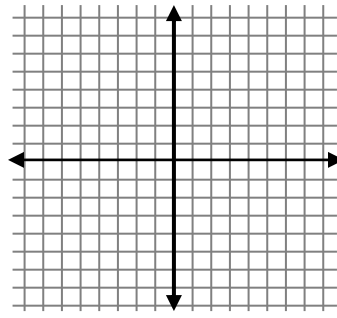
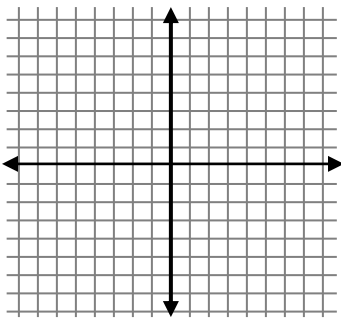
7. Solve for y in terms of x (get y by itself)

$$3x + 5xy - x^2 = 8y + 10xy$$

8. Sketch a graph of each function:

a. $f(x) = |-x^2 + 2|$

b. $f(x) = -2|x + 3| + 5$



9. Solve for x on the interval $[0, 2\pi)$

$$2 \sin^2 x - 1 = 0$$