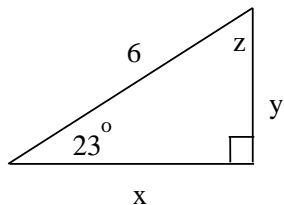
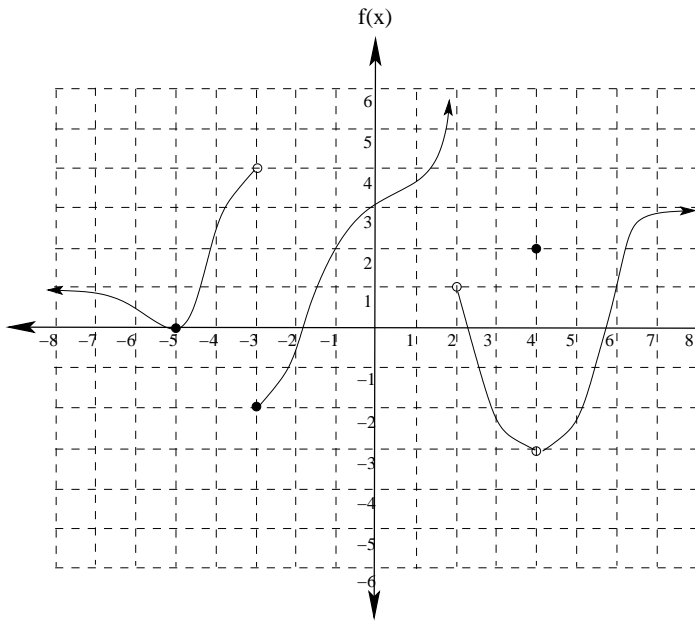


- Given the points $A : (4, -2)$ and $B : (-2, 7)$:
 - Find an equation for the line containing A and B
 - Find the line that is perpendicular to the line you found in part (a) and containing the point $(1, -1)$
- Find solutions to the inequality: $\frac{x^2 - 1}{x^2 + x - 6} \leq 0$.
- Given the function $f(x) = \frac{1}{x - 2}$
 - What is the domain of f ? Give your answer in interval notation.
 - Find $f(5)$ and $f(2a + 4)$
 - Find $\frac{f(a + h) - f(a)}{h}$ (be sure to simplify your answer).
- Given that $f(x) = \frac{1}{2x - 3}$ and $g(x) = \sqrt{x^2 - 9}$
 - Find $f \circ g(2)$
 - Find the domain of $\frac{g}{f}$? Give your answer in interval notation.
- Find the exact value of each of the following:
 - $\sin\left(\frac{7\pi}{4}\right)$
 - $\cos\left(\frac{4\pi}{3}\right)$
 - $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$
 - $\cos^{-1}(-1)$
 - $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$
- Find all solutions to the following equations. Give the exact answers.
 - $2 \sin 3x = \sqrt{3}$
 - $\sin^2(x) - \sin(x) = 0$
- Find the values of x , y and z in the triangle shown below:



8. A function f is graphed below. Find the following:



- $f(-5)$, $f(-3)$, and $f(4)$
- find the domain and range of f
- find the intervals where f is decreasing
- find $\lim_{x \rightarrow 4} f(x)$
- find $\lim_{x \rightarrow 2^-} f(x)$ and $\lim_{x \rightarrow 2^+} f(x)$
- find $\lim_{x \rightarrow -\infty} f(x)$ and $\lim_{x \rightarrow \infty} f(x)$
- find the points where $f(x)$ is discontinuous, and classify each point of discontinuity.

9. Find the following limits:

(a) $\lim_{x \rightarrow 2} \frac{3x + 7}{\sqrt{5x} - 1}$

(b) $\lim_{x \rightarrow \frac{3}{2}} \frac{2x^2 + x - 6}{4x^2 - 4x - 3}$

(c) $\lim_{x \rightarrow 2} \frac{x^4 - 16}{x^2 - x - 2}$

(d) $\lim_{x \rightarrow -2^+} \sqrt{x + 2}$

(e) $\lim_{x \rightarrow 3^+} \frac{4}{\sqrt{x} - 3}$

(f) $\lim_{x \rightarrow \infty} \frac{(3x - 5)(2x - 3)}{(2x + 1)(3x - 2)}$

(g) $\lim_{x \rightarrow \infty} \frac{(3x - 5)(2x - 3)}{(2x + 1)}$

10. Given the function

$$f(x) = \begin{cases} x^2 & \text{if } x < 1 \\ 2 & \text{if } x = 1 \\ 4 - x^2 & \text{if } x > 1 \end{cases}$$

- Graph $f(x)$.
- Find $\lim_{x \rightarrow 1^-} f(x)$, $\lim_{x \rightarrow 1^+} f(x)$, and $\lim_{x \rightarrow 1} f(x)$
- Is $f(x)$ continuous at $x = 1$? Justify your answer.

11. Given that $f(x) = x^3 + 5$, $\lim_{x \rightarrow 2} f(x) = 13$, and $\epsilon = .01$, find the largest δ such that if $0 < |x - 2| < \delta$, then $|f(x) - 13| < \epsilon$.

12. Use the formal definition of a limit to prove that $\lim_{x \rightarrow 6} 5x - 21 = 9$.

13. Let $f(x) = \frac{x^2 - x - 2}{x^2 - 2x}$.

- Find the values of x at which f is discontinuous.
- Find all vertical and horizontal asymptotes of f .

14. Find the x values at which $f(x) = \frac{\sqrt{9 - x^2}}{x^4 - 16}$ is continuous.

15. Use the Intermediate Value Theorem to show $x^5 - 3x^4 - 2x^3 - x + 1 = 0$ has a solution between 0 and 1.