

1. For each of the following functions, first complete the table. Then, based on the table values, find the given limits. If a given limit does not exist, write DNE.

(a)  $f(x) = \frac{x^2 - x - 6}{x - 3}$

$x$	2.9	2.99	2.999	2.9999			3.1	3.01	3.001	3.0001
$f(x)$										

$\lim_{x \rightarrow 3^-} f(x) =$

$\lim_{x \rightarrow 3^+} f(x) =$

$\lim_{x \rightarrow 3} f(x) =$

(b)  $g(x) = \frac{|x - 3|}{x - 3}$

$x$	2.9	2.99	2.999	2.9999			3.1	3.01	3.001	3.0001
$g(x)$										

$\lim_{x \rightarrow 3^-} g(x) =$

$\lim_{x \rightarrow 3^+} g(x) =$

$\lim_{x \rightarrow 3} g(x) =$

(c)  $s(t) = \frac{1 - \cos t}{t^2}$

$t$	-0.1	-0.01	-0.001	-0.0001			0.1	0.01	0.001	0.0001
$s(t)$										

$\lim_{x \rightarrow 0^-} s(t) =$

$\lim_{x \rightarrow 0^+} s(t) =$

$\lim_{x \rightarrow 0} s(t) =$

(d)  $E(x) = (1 + x)^{\frac{1}{x}}$

$x$	-0.1	-0.01	-0.001	-0.0001			0.1	0.01	0.001	0.0001
$E(x)$										

$\lim_{x \rightarrow 0^-} E(x) =$

$\lim_{x \rightarrow 0^+} E(x) =$

$\lim_{x \rightarrow 0} E(x) =$

2. Use the following graphs to find the limits or function values. If a limit does not exist, write DNE.

(a)  $\lim_{x \rightarrow 1} f(x) =$

(b)  $\lim_{x \rightarrow 0} g(x) =$

(c)  $\lim_{x \rightarrow 1} h(x) =$

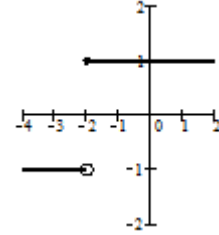
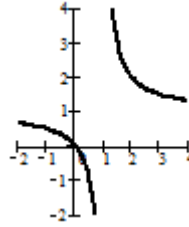
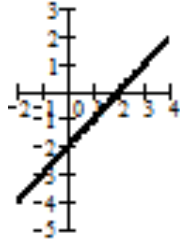
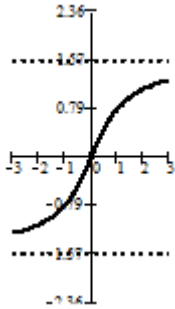
(d)  $k(-2) =$

$\lim_{x \rightarrow 0} f(x) =$

$\lim_{x \rightarrow 1} g(x) =$

$\lim_{x \rightarrow 0} h(x) =$

$\lim_{x \rightarrow -2} k(x) =$



(e)  $\lim_{x \rightarrow 1} m(x) =$

(f)  $\lim_{x \rightarrow 2^-} a(x) =$

(g)  $\lim_{x \rightarrow 1^-} d(x) =$

(h)  $\lim_{x \rightarrow 0^-} w(x) =$

$\lim_{x \rightarrow -\infty} m(x) =$

$\lim_{x \rightarrow 2^+} a(x) =$

$\lim_{x \rightarrow 1^+} d(x) =$

$\lim_{x \rightarrow 0^+} w(x) =$

$\lim_{x \rightarrow \infty} m(x) =$

$\lim_{x \rightarrow 2} a(x) =$

$\lim_{x \rightarrow 1} d(x) =$

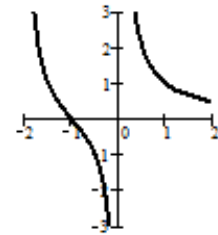
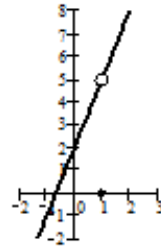
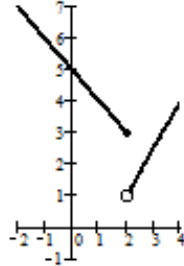
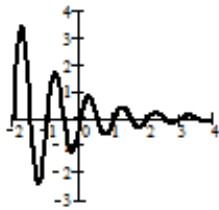
$\lim_{x \rightarrow 0} w(x) =$

$m(0) =$

$a(2) =$

$d(1) =$

$\lim_{x \rightarrow -\infty} w(x) =$



(i)  $\lim_{x \rightarrow \pi} s(x) =$

(j)  $\lim_{x \rightarrow 0} t(x) =$

(k)  $\lim_{x \rightarrow 2^-} p(x) =$

$\lim_{x \rightarrow \frac{\pi}{2}^+} s(x) =$

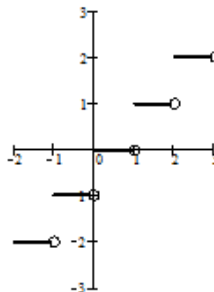
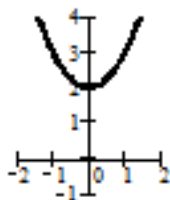
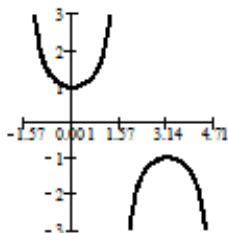
$\lim_{x \rightarrow 1} t(x) =$

$\lim_{x \rightarrow 2^+} p(x) =$

$\lim_{x \rightarrow \frac{\pi}{2}} s(x) =$

$\lim_{x \rightarrow \infty} t(x) =$

$\lim_{x \rightarrow -\frac{1}{2}} p(x) =$



3. Evaluate the following limits. If a limit does not exist, write DNE.

(a)  $\lim_{x \rightarrow 2} (x^3 - 2x^2 + 4x + 8)$

(b)  $\lim_{x \rightarrow -5} \frac{x^2 + 3x - 10}{x + 5}$

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

(d)  $\lim_{x \rightarrow 4} \frac{4 - x}{5 - \sqrt{x^2 + 9}}$

4. Given:  $\lim_{x \rightarrow 2} f(x) = 4$ ,  $\lim_{x \rightarrow 2} g(x) = -6$ ,  $\lim_{x \rightarrow 2} h(x) = 0$ ,  $\lim_{x \rightarrow 2} k(x) = \infty$ , find each of the following.

*Caution: For some problems, the form of the function may result in different solutions. State each possible solution along with the conditions under which that solution occurs.*

(a)  $\lim_{x \rightarrow 2} (f - g)(x)$

(b)  $\lim_{x \rightarrow 2} (fg)(x)$

(c)  $\lim_{x \rightarrow 2} \sqrt{h(x)}$

(d)  $\lim_{x \rightarrow 2} [5g(x) + 3x^2]$

(e)  $\lim_{x \rightarrow 2} \frac{g(x)}{x + k(x)}$

(f)  $\lim_{x \rightarrow 2} 3x^3g(x)$

(g)  $\lim_{x \rightarrow 2} [x^2 + 3x - 2f(x)]$

(h)  $\lim_{x \rightarrow 2} \frac{2f(x)}{3 - \sqrt{10 + g(x)}}$

(i)  $\lim_{x \rightarrow 2} \frac{7 + [f(x)]^2}{x - f(x)g(x)}$

(j)  $\lim_{x \rightarrow 2} \frac{1}{|4 - f(x)|}$