

Assorted Limits

Evaluate each limit.

1) $\lim_{r \rightarrow -1} f(r), f(r) = \begin{cases} -r^2 + 2r - 1, & r \leq -1 \\ \frac{r}{2} - \frac{7}{2}, & r > -1 \end{cases}$

-4

2) $\lim_{x \rightarrow 2^-} (|x - 2| - 1)$

-1

3) $\lim_{t \rightarrow 5} h(t), h(t) = \begin{cases} -\frac{t}{2} + 1, & t \leq 5 \\ 0, & t > 5 \end{cases}$

Does not exist.

4) $\lim_{w \rightarrow -1} \frac{5w + 5}{|w + 1|}$

Does not exist.

5) $\lim_{x \rightarrow 0} \frac{\sin 2x}{3x}$

 $\frac{2}{3}$

6) $\lim_{x \rightarrow -2} -\frac{x^2 + 6x + 8}{x + 2}$

-2

7) $\lim_{x \rightarrow 2} \frac{x - 2}{\sqrt{x + 7} - 3}$

6

8) $\lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{x - 1}$

 $\frac{1}{2}$

$$9) \lim_{x \rightarrow -3} \frac{x^2 - x - 12}{x + 3}$$

-7

$$10) \lim_{x \rightarrow 0} \frac{4 - 4\cos x}{3x}$$

0

$$11) \lim_{x \rightarrow -2} -\frac{x + 2}{x^2 + x - 2}$$

$\frac{1}{3}$

$$12) \lim_{w \rightarrow 3^+} -\frac{3}{w - 3}$$

$-\infty$

$$13) \lim_{s \rightarrow 1^+} \frac{s + 2}{s^2 + s - 2}$$

∞

$$14) \lim_{r \rightarrow 3^+} \frac{r - 3}{r^2 - 7r + 12}$$

-1

$$15) \lim_{x \rightarrow -\infty} \frac{x + 3}{2x^2 + 2x + 1}$$

0

$$16) \lim_{x \rightarrow \infty} \frac{\sin x}{x}$$

0

$$17) \lim_{x \rightarrow \infty} \sqrt[3]{\frac{4x^2 + 1}{x^2 + 2}}$$

$\sqrt[3]{4}$

$$18) \lim_{x \rightarrow -\infty} \frac{2x - 3}{\sqrt{4x^2 + 2}}$$

-1