

Manipulating Limits Worksheet - Answer Key

Evaluate the following.

1. $\left(\lim_{x \rightarrow -5} \frac{x^2 + 3x - 10}{x + 5} \right)^2$
49

2. $\lim_{x \rightarrow \infty} \frac{1}{x^2} - \frac{2}{x}$
0

3. $\lim_{x \rightarrow \infty} \left[\ln\left(1 + \frac{1}{x}\right) + \ln\left(1 - \frac{1}{x}\right) \right]$
0

4. $\lim_{x \rightarrow -1} \left[\frac{x+1}{x^2-1} \times \frac{x-1}{x^2+1} \right]$
 $\frac{1}{2}$

5. $\lim_{x \rightarrow \infty} \frac{e^{-x^2} + 3}{1 - e^{-x^2}}$
3

6. If $\lim_{x \rightarrow -1} f(x) = 4$, find
 $\lim_{x \rightarrow -1} 2f(x) - \sqrt{f(x)}$.
6

7. If $\lim_{x \rightarrow 3} g(x) = -9$, find $\lim_{x \rightarrow 3} g(x - 3)$.
The limit cannot be determined.

8. If $\lim_{x \rightarrow 0} h(x) = 5$ and $\lim_{x \rightarrow 0} g(x) = 3$, find
 $\lim_{x \rightarrow 0} [3h(x) + 5g(x)]$.
30

9. If $\lim_{x \rightarrow 0} h(x) = 5$ and $\lim_{x \rightarrow 0} g(x) = 3$, find
 $\lim_{x \rightarrow 0} \frac{3h(x)}{g(x)^2}$.
 $\frac{5}{3}$

10. If $\lim_{x \rightarrow \infty} u(x) = a$ and $\lim_{x \rightarrow \infty} v(x) = b$, find
 $\lim_{x \rightarrow \infty} u^2(x) + uv(x) = a$.
 $a^2 + ab$

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