

2.3 Basic Limit Laws

For any constants k and c ,

$$\lim_{x \rightarrow c} k = k \quad \lim_{x \rightarrow c} x = c$$

1. $\lim_{x \rightarrow 2} 3 =$

2. $\lim_{x \rightarrow 5} x =$

If $\lim_{x \rightarrow c} f(x)$ and $\lim_{x \rightarrow c} g(x)$ exist, then

- Sum Law
- Constant Multiple Law
- Product Law
- Quotient Law
- Powers and Roots

3. $\lim_{x \rightarrow 3} x^2 =$

4. $\lim_{x \rightarrow 2} (6x^3 - 7) =$

5. Assuming that $\lim_{x \rightarrow 6} f(x) = 4$, find

a) $\lim_{x \rightarrow 6} [f(x)]^2 =$

b) $\lim_{x \rightarrow 6} \frac{1}{f(x)} =$

c) $\lim_{x \rightarrow 6} xf(x) =$

6. $\lim_{x \rightarrow 2} \frac{x^2 - 3x + 5}{x + 3} =$

7. $\lim_{x \rightarrow 0} \sqrt{x^2 + 4} =$

8. $\lim_{x \rightarrow 2} (x + 1)(3x^2 - 9) =$

9. $\lim_{x \rightarrow 5} x^{\frac{-1}{2}} (x + 3)^{\frac{2}{3}} =$

10. Assuming that $\lim_{x \rightarrow -1} f(x) = 3$ and $\lim_{x \rightarrow -1} g(x) = 4$, find

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