

Evaluate each limit algebraically.

1) $\lim_{x \rightarrow 2} \sin\left(\frac{\pi x}{4}\right)$

2) $\lim_{x \rightarrow -5} \frac{x^2 - 25}{x^2 + 7x + 10}$

3) $\lim_{x \rightarrow 5} \frac{x - 5}{x^2 - 25}$

4) $\lim_{x \rightarrow 0} \frac{3x^4 - 5x^2}{x^3 - 4x^2}$

5) $\lim_{x \rightarrow 1} \frac{1 - x^2}{x - 1}$

6) $\lim_{\Delta x \rightarrow 5} \frac{2(x + \Delta x) - 2x}{\Delta x}$

7) $\lim_{x \rightarrow 0} \frac{\frac{1}{x+3} - \frac{1}{3}}{x}$

8) $\lim_{x \rightarrow 0} \frac{(1+h)^3 - 1}{h}$

9) $\lim_{x \rightarrow 0} \frac{\sqrt{x+5} - \sqrt{5}}{x}$

$$10) \lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3}$$

$$11) \lim_{\theta \rightarrow 0} \frac{\sin 5\theta}{\theta}$$

$$12) \lim_{\theta \rightarrow 0} \frac{\sin 5\theta}{3\theta}$$

$$13) \lim_{x \rightarrow 0} \frac{\sin^2 x}{x}$$

$$14) \lim_{x \rightarrow 0} \frac{\cos x}{\cot x}$$

$$15) \lim_{x \rightarrow 0} \frac{\sin x - \sin x \cos x}{2x^2}$$

16) If $\lim_{x \rightarrow 2} f(x) = 5$ and $\lim_{x \rightarrow 2} g(x) = -3$, evaluate the following limits:

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

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

c) $\lim_{x \rightarrow 2} f(x) \cdot g(x)$

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

e) $\lim_{x \rightarrow 2} [f(x)]^2$