

Use l'Hospital's rule to find the limits in Problems 1–40.

$$1. \lim_{x \rightarrow 4} \frac{x^2 - 16}{x - 4}$$

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

$$5. \lim_{x \rightarrow 0} \frac{\sqrt{2x + 4} - 2}{x}$$

$$7. \lim_{x \rightarrow 0} \frac{\sin x}{x \cos x}$$

$$9. \lim_{x \rightarrow 0} \frac{1 - \cos x}{x \tan x}$$

$$11. \lim_{x \rightarrow 0^-} \frac{\sqrt{x}}{\ln(x + 1)}$$

$$13. \lim_{x \rightarrow 0} \frac{2^x - 1}{3^x - 1}$$

$$15. \lim_{x \rightarrow 0} \frac{e^x - 1 - x}{x^2}$$

$$17. \lim_{x \rightarrow \infty} \frac{(\ln x)^2}{x^2}$$

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

$$4. \lim_{x \rightarrow -3} \frac{x + 3}{x^2 + 2x - 3}$$

$$6. \lim_{x \rightarrow 0} \frac{3 - \sqrt{2x + 9}}{2x}$$

$$8. \lim_{x \rightarrow 0} \frac{x \sin x}{1 - \cos x}$$

$$10. \lim_{x \rightarrow \pi/2} \frac{\sin(\frac{\pi}{2} - x)}{\cos x}$$

$$12. \lim_{x \rightarrow \infty} \frac{\ln x}{\sqrt{x}}$$

$$14. \lim_{x \rightarrow 0} \frac{2^{-x} - 1}{5^x - 1}$$

$$16. \lim_{x \rightarrow 0} \frac{e^x - 1 - x - \frac{x^2}{2}}{x^3}$$

$$18. \lim_{x \rightarrow \infty} \frac{x^4}{e^x}$$