

In Exercises 15–18, find each limit, if possible.

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

$$(b) \lim_{x \rightarrow \infty} \frac{x^2 + 2}{x^2 - 1}$$

$$(c) \lim_{x \rightarrow \infty} \frac{x^2 + 2}{x - 1}$$

$$17. (a) \lim_{x \rightarrow \infty} \frac{5 - 2x^{3/2}}{3x^2 - 4}$$

$$(b) \lim_{x \rightarrow \infty} \frac{5 - 2x^{3/2}}{3x^{3/2} - 4}$$

$$(c) \lim_{x \rightarrow \infty} \frac{5 - 2x^{3/2}}{3x - 4}$$

$$16. (a) \lim_{x \rightarrow \infty} \frac{3 - 2x}{3x^3 - 1}$$

$$(b) \lim_{x \rightarrow \infty} \frac{3 - 2x}{3x - 1}$$

$$(c) \lim_{x \rightarrow \infty} \frac{3 - 2x^2}{3x - 1}$$

$$18. (a) \lim_{x \rightarrow \infty} \frac{5x^{3/2}}{4x^2 + 1}$$

$$(b) \lim_{x \rightarrow \infty} \frac{5x^{3/2}}{4x^{3/2} + 1}$$

$$(c) \lim_{x \rightarrow \infty} \frac{5x^{3/2}}{4\sqrt{x} + 1}$$

In Exercises 19–38, find the limit.

$$19. \lim_{x \rightarrow \infty} \left(4 + \frac{3}{x} \right)$$

$$20. \lim_{x \rightarrow -\infty} \left(\frac{5}{x} - \frac{x}{3} \right)$$

$$21. \lim_{x \rightarrow \infty} \frac{2x - 1}{3x + 2}$$

$$22. \lim_{x \rightarrow \infty} \frac{x^2 + 3}{2x^2 - 1}$$

$$23. \lim_{x \rightarrow \infty} \frac{x}{x^2 - 1}$$

$$24. \lim_{x \rightarrow \infty} \frac{5x^3 + 1}{10x^3 - 3x^2 + 7}$$

$$25. \lim_{x \rightarrow -\infty} \frac{5x^2}{x + 3}$$

$$26. \lim_{x \rightarrow -\infty} \left(\frac{1}{2}x - \frac{4}{x^2} \right)$$

$$27. \lim_{x \rightarrow -\infty} \frac{x}{\sqrt{x^2 - x}}$$

$$28. \lim_{x \rightarrow -\infty} \frac{x}{\sqrt{x^2 + 1}}$$

$$29. \lim_{x \rightarrow -\infty} \frac{2x + 1}{\sqrt{x^2 - x}}$$

$$30. \lim_{x \rightarrow -\infty} \frac{-3x + 1}{\sqrt{x^2 + x}}$$

$$31. \lim_{x \rightarrow \infty} \frac{\sqrt{x^2 - 1}}{2x - 1}$$

$$32. \lim_{x \rightarrow -\infty} \frac{\sqrt{x^4 - 1}}{x^3 - 1}$$

$$33. \lim_{x \rightarrow \infty} \frac{x + 1}{(x^2 + 1)^{1/3}}$$

$$34. \lim_{x \rightarrow -\infty} \frac{2x}{(x^6 - 1)^{1/3}}$$

$$35. \lim_{x \rightarrow \infty} \frac{1}{2x + \sin x}$$

$$36. \lim_{x \rightarrow \infty} \cos \frac{1}{x}$$

$$37. \lim_{x \rightarrow \infty} \frac{\sin 2x}{x}$$

$$38. \lim_{x \rightarrow \infty} \frac{x - \cos x}{x}$$