

<52> #1-20 all

Find the limits if they exist, in Problems 1-20.

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

2. $\lim_{x \rightarrow \infty} (x^2 - 4)$

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

4. $\lim_{x \rightarrow \infty} \frac{1}{x^2+1}$

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

6. $\lim_{x \rightarrow \infty} \frac{x^2-8x+15}{x-3}$

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

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

9. $\lim_{x \rightarrow \infty} \frac{2x^2-5x-12}{x^2-4}$

10. $\lim_{x \rightarrow \infty} \frac{x^2-8}{x^3+2x+4}$

11. $\lim_{x \rightarrow \infty} \frac{x^2+2x+4}{x^2-8}$

12. $\lim_{x \rightarrow \infty} \frac{x^3+2}{4x^3+5}$

13. $\lim_{x \rightarrow \infty} \frac{6-x}{2x-15}$

14. $\lim_{|x| \rightarrow \infty} \frac{2x^2-5x-3}{x^2-9}$

15. $\lim_{x \rightarrow \infty} \frac{5x+10,000}{x-1}$

16. $\lim_{x \rightarrow \infty} \frac{4x+100,000}{x+1}$

17. $\lim_{x \rightarrow \infty} \frac{4x^4-3x^3+2x+1}{3x^4-9}$

18. $\lim_{x \rightarrow \infty} \frac{x^4+1}{x^2-1}$

19. $\lim_{x \rightarrow \infty} \frac{3x^3-2x^2+1}{5x^3+3x-100}$

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

<53> # 21-37

Find the horizontal, vertical, and slant asymptotes, if any exist, for the given functions.

21. $y = \frac{1}{x}$

22. $y = \frac{1}{x} + 2$

23. $y = -\frac{1}{x} + 1$

24. $y = \frac{4}{x^2}$

25. $y = \frac{2x^2 + 2}{x^2}$

26. $y = \frac{1}{x-4}$

27. $y = \frac{-1}{x+3}$

28. $y = \frac{4x}{x^2 - 2}$

29. $y = \frac{x^2}{x-4}$

30. $y = \frac{x^3}{(x-1)^2}$

31. $y = \frac{2x^3 - 3x^2 - 32x - 15}{x^2 - 2x - 15}$

32. $y = \frac{x^2}{x^3 - x^2 - 20x}$

Graph each curve on a sheet of graph paper by finding intercepts and asymptotes.

33. $y = \frac{x+3}{x-2}$

34. $y = \frac{x-1}{x+1}$

35. $y = \frac{3x+5}{3x-2}$

36. $y = \frac{x^2 - x - 2}{x^2 - 2x - 3}$

37. $y = \frac{x^2 - x - 12}{x-4}$