Compute the limit and use the ϵ-δ definition of limit to prove your answer is correct.

1. $\lim_{x\to 2}(3x-7)$
2. $\lim_{x\to 5}(-x+4)$
3. $\lim_{x\to 200}\left(\frac{x}{20}-37\right)$
4. $\lim_{x\to 4} 3$
5. $\lim_{x\to 5} 13$
6. $\lim_{x\to 2}(4x^2+3x-5)$
7. $\lim_{x\to -3}(x^2+2x+1)$
8. $\lim_{x\to 10}(x^3+3x)$
9. $\lim_{x\to 1}(x^4+2x)$
10. $\lim_{x\to 0}(x^5-3)$
11. $\lim_{t\to 1}(t^5+3t-1)$
12. $\lim_{x\to 5}(x^2+3)$
13. $\lim_{x\to 3}\frac{3x-1}{x^2-1}$
14. $\lim_{x\to -2}\frac{x^2-1}{2x-3}$
15. $\lim_{t\to 5}\frac{t-1}{t+1}$
16. $\lim_{y\to -1}\frac{2y^2-3y+1}{y^2-3y+4}$
17. $\lim_{p\to 0}\frac{3p^3-2p+8}{2p+4}$
18. $\lim_{r\to -3}\frac{2r+3}{r-1}$
19. $\lim_{x\to 1}\sqrt{x+3}$
20. $\lim_{t\to 2}\frac{1}{\sqrt[4]{15+t}}$
21. $\lim_{x\to 4}\frac{x}{\sqrt{x+5}}$
22. $\lim_{x\to -2}\frac{x^2+1}{\sqrt[5]{x+3}}$

Explain why the limits are not the indicated numbers.

23. $\lim_{x\to 2}(x^2+3x+4)\neq 10$
24. $\lim_{x\to 0}\frac{|x|}{x}\neq 1$
25. $\lim_{x\to 4}\frac{1}{x-4}\neq 0$
26. $\lim_{x\to 3}\frac{x^2+3x-18}{x^2-9}\neq 4$

Does the limit exist? If so, give the limit and prove your answer is correct. If not, state (without proof) how you know the limit does not exist.

27. $\lim_{x\to 0}\frac{-2}{x}$
28. $\lim_{x\to 5}(-x^2+4)$
29. $\lim_{x\to 3}\frac{|x-3|}{x-3}$

30. $\lim_{x\to 4} \dfrac{x-4}{|x-4|}$

31. $\lim_{x\to 1} \dfrac{x^2-1}{x-1}$

32. $\lim_{x\to 4} \dfrac{\sqrt{x}-2}{x-4}$

33. $\lim_{x\to -1} \dfrac{x^3+1}{x+1}$

34. $\lim_{x\to -1} \dfrac{x^3-1}{x+1}$

Compute the limit and use the $\epsilon - \delta$ definition to prove the limit is what you say it is.

35. $\lim_{x\to 10^+} (x^2-1)$

36. $\lim_{x\to 1^+} \sqrt{x-1}$

37. $\lim_{x\to 2^-} \dfrac{|x-2|}{x-2}$

38. $\lim_{x\to 2^+} \dfrac{|x-2|}{x-2}$

39. $\lim_{x\to -1^+} \dfrac{x^2+1}{|x-1|}$

40. $\lim_{x\to -1^-} \dfrac{x^2+1}{|x-1|}$