Algebra and Limits … Set 2

Algebraic Limits Worksheet

Given $\lim\limits_{x \to a} f(x) = -3, \lim\limits_{x \to a} g(x) = 0$, and $\lim\limits_{x \to a} h(x) = 8$, find each limit if it exists.

1. $\lim\limits_{x \to a}[f(x) + h(x)]$

2. $\lim\limits_{x \to a}[f(x)]^2$

3. $\lim\limits_{x \to a} \sqrt[3]{h(x)}$

4. $\lim\limits_{x \to a} \dfrac{1}{f(x)}$

5. $\lim\limits_{x \to a} \dfrac{g(x)}{h(x)}$

6. $\lim\limits_{x \to a} \dfrac{h(x)}{g(x)}$

7. $\lim\limits_{x \to a} \dfrac{2f(x)}{h(x) - f(x)}$

8. $\lim\limits_{x \to a}[f(x)h(x)]$

9. $\lim\limits_{x \to a}\left[\dfrac{g(x) + h(x)}{f(x)}\right]$

Evaluate the limits:

10. $\lim\limits_{x \to 0} \dfrac{x^2 + 7x + 6}{x + 3}$

11. $\lim\limits_{x \to 2} \dfrac{\frac{2}{x^2} - \frac{1}{2}}{x - 2}$

12. $\lim\limits_{x \to 2} \dfrac{(2x+1)^2 - 25}{x - 2}$

13. $\lim\limits_{h \to 0} \dfrac{(2+h)^3 - 8}{h}$

14. $\lim\limits_{x \to 3} \dfrac{x^2 - 9}{x + 3}$

15. $\lim\limits_{h \to 0} \dfrac{(1+h)^2 - 1^2}{h}$

16. $\lim\limits_{h \to 0} \dfrac{(-5+h)^2 - 25}{h}$

17. $\lim\limits_{t \to 2} \dfrac{t^2 - 4}{t^3 - 8}$

18. $\lim\limits_{u \to 2} \dfrac{\sqrt{4u+1} - 3}{u - 2}$

19. $\lim\limits_{x \to 3} \dfrac{\frac{1}{x} - \frac{1}{3}}{x - 3}$

20. $\lim\limits_{h \to 0} \dfrac{\frac{1}{2+h} - \frac{1}{2}}{h}$

21. $\lim\limits_{x \to 2} \dfrac{x^4 - 2x^2 - 8}{x^2 - x - 6}$

22. $\lim\limits_{x \to -2} \dfrac{\frac{x}{x+4} + 1}{x + 2}$

23. $\lim\limits_{x \to 3} \dfrac{x^2 - 9}{2x^2 + 7x + 3}$

24. $\lim\limits_{x \to 1} \dfrac{x^2 - x - 2}{x - 2}$

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25. $\lim\limits_{x \to 1} \dfrac{4x^4 - 5x^2 + 1}{x^2 + 2x - 3}$

26. $\lim\limits_{x \to 4} \dfrac{x^2 - 4x}{x^2 - 3x - 4}$

27. $\lim\limits_{h \to 0} \dfrac{(3+h)^2 - 9}{h}$

28. $\lim\limits_{h \to 0} \dfrac{\frac{1}{(h+2)^2} - \frac{1}{4}}{h}$

29. $\lim\limits_{x \to 1} \dfrac{x^2 - 3x + 2}{x^3 - 1}$

30. $\lim\limits_{x \to 16} \dfrac{4 - \sqrt{x}}{16x - x^2}$

31. $\lim\limits_{x \to 4} \dfrac{\sqrt{x} - 2}{x - 4}$

32. $\lim\limits_{x \to 3} \dfrac{3(x+1)^{-1} - 3(4)^{-1}}{x - 3}$

33. $\lim\limits_{t \to 0} \dfrac{\sqrt{t^2 + 9} - 3}{t^2}$

34. $\displaystyle\lim_{x\to1}\frac{\frac{2x}{x+1}-1}{x-1}$

35. $\displaystyle\lim_{x\to2}\frac{x^3+x^2-4x-4}{x^2+x-6}$

36. $\displaystyle\lim_{h\to0}\frac{(x+h)^2-x^2}{h}$

37. $\displaystyle\lim_{t\to-3}\frac{t^2-9}{2t^2+7t+3}$

38. $\displaystyle\lim_{x\to0}\frac{\frac{3}{x+5}-\frac{3}{5}}{x}$

39. $\displaystyle\lim_{h\to0}\frac{(3+h)^3-27}{h}$

40. $\displaystyle\lim_{p\to-2}\frac{(p+4)^{-1}-2^{-1}}{p+2}$

41. $\displaystyle\lim_{t\to0}\frac{\sqrt{1+t}-\sqrt{1-t}}{t}$

42. $\displaystyle\lim_{x\to3}\frac{\sqrt{x+6}-x}{x^3-3x^2}$