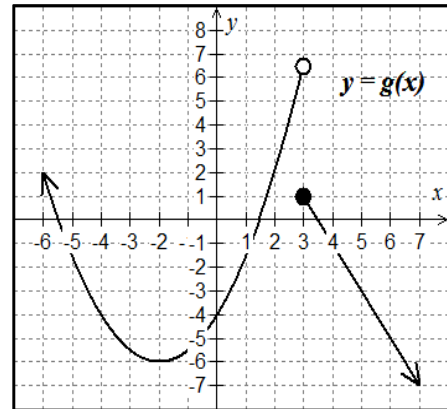
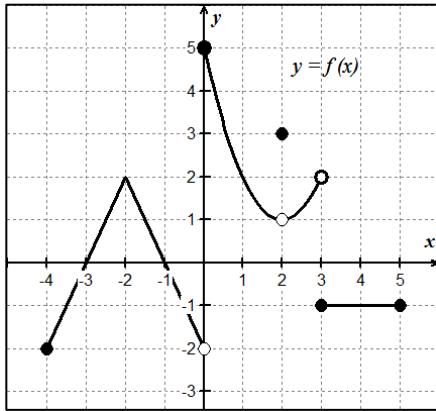


10.2 Finding Limits Analytically Homework

Problems 1 – 10, find each of the following limits analytically.

1. $\lim_{x \rightarrow -4} \frac{5x}{4 - x}$	2. $\lim_{x \rightarrow \frac{1}{2}} (6 - 5x)$
3. $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x - 2}$	4. $\lim_{x \rightarrow -3} \frac{2x^2 + 7x + 3}{x^2 + 8x + 15}$
5. $\lim_{x \rightarrow 6} \frac{x^2 - 6x}{x^2 - 36}$	6. $\lim_{x \rightarrow 0} \frac{\sqrt{2+x} - \sqrt{2}}{x}$
7. $\lim_{x \rightarrow -2} \frac{x^2 - x - 6}{2x + 4}$	8. $\lim_{x \rightarrow 0} \frac{(x+3)^2 - 9}{x}$
9. $\lim_{x \rightarrow 0} \frac{\frac{1}{x+2} - \frac{1}{2}}{x}$	10. $\lim_{h \rightarrow 0} \frac{(x+h)^2 - 3(x+h) - x^2 + 3x}{h}$

Problems 11 – 19, use the graph to find the limit (if it exists). If the limit does not exist, explain why.



11. $\lim_{x \rightarrow 2} [f(x) + g(x)]$	12. $\lim_{x \rightarrow -2} [3f(x) - g(x)]$	13. $\lim_{x \rightarrow 5} [g(x)]^2$
14. $\lim_{x \rightarrow 2} \frac{f(x)}{g(x)}$	15. $\lim_{x \rightarrow 1} [f(x) - g(x)]$	16. $\lim_{x \rightarrow 0^+} [f(x) \cdot g(x)]$
17. $\lim_{x \rightarrow -2} \sqrt{f(x) \cdot g(x)}$	18. $\lim_{x \rightarrow 4} \frac{5g(x)}{f(x)}$	19. $\lim_{x \rightarrow -4^+} \frac{f(x)}{g(x)}$

Problems 20– 23, find the limits if $\lim_{x \rightarrow c} f(x) = -3$ and $\lim_{x \rightarrow c} g(x) = 5$

20. $\lim_{x \rightarrow c} [f(x) + 2]^3$	21. $\lim_{x \rightarrow c} [f(x) \cdot 2g(x)]$
22. $\lim_{x \rightarrow c} \frac{[f(x)]^2}{1 - g(x)}$	23. $\lim_{x \rightarrow c} \frac{4f(x) + 3g(x)}{g(x) - f(x)}$

Problems 24 – 31, find the value of each limit. For a limit that does not exist, state why.

24. $\lim_{x \rightarrow -2} (x - 6)^{4/3}$

25. $\lim_{\theta \rightarrow \frac{\pi}{6}} \theta^2 \tan \theta$

26. $\lim_{x \rightarrow 3} e^x \cos \frac{\pi}{x}$

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

28. $\lim_{x \rightarrow 0} \frac{\sin 2x}{3x}$

29. $\lim_{x \rightarrow 0} \frac{\sin 2x}{2x^2 + x}$

30. $\lim_{x \rightarrow 0} \frac{\sin^2 3x}{x^2}$

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