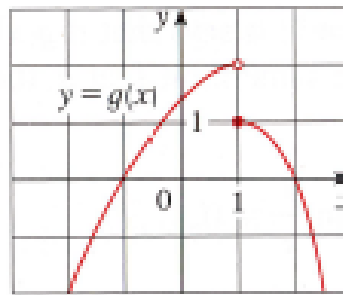
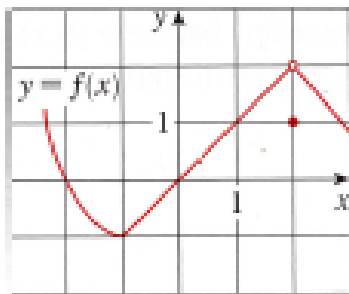


1. Given that: $\lim_{x \rightarrow 2} f(x) = 4$ $\lim_{x \rightarrow 2} g(x) = -2$ $\lim_{x \rightarrow 2} h(x) = 0$
 Find the limits that exist. If the limit does not exist, explain why.

| | | |
|---|--|--|
| A.) $\lim_{x \rightarrow 2} [f(x) + 5g(x)]$ | B.) $\lim_{x \rightarrow 2} [g(x)]^3$ | C.) $\lim_{x \rightarrow 2} \sqrt{f(x)}$ |
| D.) $\lim_{x \rightarrow 2} \frac{3f(x)}{g(x)}$ | E.) $\lim_{x \rightarrow 2} \frac{g(x)}{h(x)}$ | F.) $\lim_{x \rightarrow 2} \frac{g(x)h(x)}{f(x)}$ |

2. The graphs of f and g are given. Use them to evaluate each limit, if it exists. If the limit does not exist, explain why.



| | | |
|---|--|--|
| A.) $\lim_{x \rightarrow 2} [f(x) + g(x)]$ | B.) $\lim_{x \rightarrow 1} [f(x) + g(x)]$ | C.) $\lim_{x \rightarrow 0} [f(x)g(x)]$ |
| D.) $\lim_{x \rightarrow -1} \frac{f(x)}{g(x)}$ | E.) $\lim_{x \rightarrow 2} [x^3 f(x)]$ | B.) $\lim_{x \rightarrow 1} \sqrt{3 + f(x)}$ |

3-18: Evaluate the limit, if it exists.

| | |
|--|---|
| 3. $\lim_{x \rightarrow 5} \frac{x^2 - 6x + 5}{x - 5}$ | 4. $\lim_{x \rightarrow 4} \frac{x^2 - 4x}{x^2 - 3x - 4}$ |
| 5. $\lim_{x \rightarrow 5} \frac{x^2 - 5x + 6}{x - 3}$ | 6. $\lim_{x \rightarrow -1} \frac{x^2 - 4x}{x^2 - 3x - 4}$ |
| 7. $\lim_{t \rightarrow -3} \frac{t^2 - 9}{2t^2 + 7t + 3}$ | 8. $\lim_{x \rightarrow -1} \frac{2x^2 + 3x + 1}{x^2 - 2x - 3}$ |

$$9. \lim_{h \rightarrow 0} \frac{(-5+h)^2 - 25}{h}$$

$$10. \lim_{h \rightarrow 0} \frac{(2+h)^3 - 8}{h}$$

$$11. \lim_{x \rightarrow -2} \frac{x+2}{x^3+8}$$

$$12. \lim_{t \rightarrow 1} \frac{t^4-1}{t^3-1}$$

$$13. \lim_{h \rightarrow 0} \frac{\sqrt{9+h}-3}{h}$$

$$14. \lim_{u \rightarrow 2} \frac{\sqrt{4u+1}-3}{u-2}$$

$$15. \lim_{x \rightarrow -4} \frac{\frac{1}{4+x}}{4+x}$$

$$16. \lim_{h \rightarrow 0} \frac{\frac{1}{3+h} - \frac{1}{3}}{h}$$

$$17. \lim_{t \rightarrow 0} \frac{\sqrt{1+t} - \sqrt{1-t}}{t}$$

$$18. \lim_{x \rightarrow -4} \frac{\sqrt{x^2+9}-5}{x+4}$$

19. If $4x - 9 \leq f(x) \leq x^2 - 4x + 7$ for $x \geq 0$, find $\lim_{x \rightarrow 4} f(x)$.

20. If $2x \leq g(x) \leq x^4 - x^2 + 2$ for all x , evaluate $\lim_{x \rightarrow 1} g(x)$.

Answers:

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|-----|---------------|--------|---------------|--------|---------------|-------|-----------------|------|----------------|------|---------------|-------|----------------|-----|----|-----|----------------|
| 1. | a.) -6 | b.) -8 | c.) 2 | d.) -6 | e.) dne | f.) 0 | 2. | a. 2 | b. dne | c. 0 | d. dne | e. 16 | f. 2 | | | | |
| 3. | 4 | 4. | $\frac{4}{5}$ | 5. | 3 | 6. | dne | 7. | $\frac{6}{5}$ | 8. | $\frac{1}{4}$ | 9. | -10 | 10. | 12 | 11. | $\frac{1}{12}$ |
| 12. | $\frac{4}{3}$ | 13. | $\frac{1}{6}$ | 14. | $\frac{2}{3}$ | 15. | $-\frac{1}{16}$ | 16. | $-\frac{1}{9}$ | 17. | 1 | 18. | $-\frac{4}{5}$ | 19. | 7 | 20. | 2 |