

Section 2-4 : Limit Properties

1. Given $\lim_{x \rightarrow 0} f(x) = 5$, $\lim_{x \rightarrow 0} g(x) = -1$ and $\lim_{x \rightarrow 0} h(x) = -3$ use the limit properties given in this section to compute each of the following limits. If it is not possible to compute any of the limits clearly explain why not.

(a) $\lim_{x \rightarrow 0} [11 + 7f(x)]$

(b) $\lim_{x \rightarrow 0} [6 - 4g(x) - 10h(x)]$

(c) $\lim_{x \rightarrow 0} [4g(x) - 12f(x) + 3h(x)]$

(d) $\lim_{x \rightarrow 0} [g(x)(1 + 2f(x))]$

2. Given $\lim_{x \rightarrow 12} f(x) = 2$, $\lim_{x \rightarrow 12} g(x) = 6$ and $\lim_{x \rightarrow 12} h(x) = 9$ use the limit properties given in this section to compute each of the following limits. If it is not possible to compute any of the limits clearly explain why not.

(a) $\lim_{x \rightarrow 12} \left[h(x)f(x) + \frac{1 + g(x)}{g(x)} \right]$

(b) $\lim_{x \rightarrow 12} [(3 - f(x))(1 + 2g(x))]$

(c) $\lim_{x \rightarrow 12} \frac{f(x) + 1}{3g(x) - 2h(x)}$

(d) $\lim_{x \rightarrow 12} \frac{f(x) - 2g(x)}{7 + h(x)f(x)}$

3. Given $\lim_{x \rightarrow -1} f(x) = 0$, $\lim_{x \rightarrow -1} g(x) = 9$ and $\lim_{x \rightarrow -1} h(x) = -7$ use the limit properties given in this section to compute each of the following limits. If it is not possible to compute any of the limits clearly explain why not.

(a) $\lim_{x \rightarrow -1} [(g(x))^2 - (h(x))^3]$

(b) $\lim_{x \rightarrow -1} \sqrt{3 + 6f(x) - h(x)}$

(c) $\lim_{x \rightarrow -1} \sqrt{f(x) - g(x)h(x)}$

(d) $\lim_{x \rightarrow -1} \sqrt[4]{\frac{2 + g(x)}{1 - 10h(x)}}$

For each of the following limits use the limit properties given in this section to compute the limit. At each step clearly indicate the property being used. If it is not possible to compute any of the limits clearly explain why not.

4. $\lim_{x \rightarrow 4} (3x^2 - 9x + 2)$

$$5. \lim_{w \rightarrow -1} \left(w - (w^2 + 3)^2 \right)$$

$$6. \lim_{t \rightarrow 0} (t^4 - 4t^2 + 12t - 8)$$

$$7. \lim_{z \rightarrow 2} \frac{10 + z^2}{3 - 4z}$$

$$8. \lim_{x \rightarrow 7} \frac{8x}{x^2 - 14x + 49}$$

$$9. \lim_{y \rightarrow -3} \frac{y^3 - 20y + 4}{y^2 + 8y - 1}$$

$$10. \lim_{w \rightarrow -6} \sqrt[3]{8 + 7w}$$

$$11. \lim_{t \rightarrow 1} (4t^2 - \sqrt{8t + 1})$$

$$12. \lim_{x \rightarrow 8} (\sqrt[4]{3x - 8} + \sqrt{9 + 2x})$$

