

Answer on Question #61372 – Math – Calculus

Question

10) Evaluate the limit

$$\lim_{x \rightarrow 0} (x^2 + 4x - 12)(x^2 - 2x)$$

- a) 3
- b) 2
- c) 4
- d) 0

Solution

$$\begin{aligned} \lim_{x \rightarrow 0} (x^2 + 4x - 12)(x^2 - 2x) &= \lim_{x \rightarrow 0} (x^4 - 2x^3 + 4x^3 - 8x^2 - 12x^2 + 24x) = \lim_{x \rightarrow 0} (x^4 + 2x^3 - 20x^2 + 24x) = \\ &= 0^4 + 2 \cdot 0^3 - 20 \cdot 0^2 + 24 \cdot 0 = 0. \end{aligned}$$

Answer: d) 0

Question

9) Let

$$h(x) = x + 42x - 5$$

find

$$h^{-1}$$

- a) $h^{-1}(x) = 2 + xx + 5$
- b) $h^{-1}(x) = 2 + 3xx - 5$
- c) $h^{-1}(x) = 4 - 2xx - 5$
- d) $h^{-1}(x) = 4 + 5x2x - 5$

Solution

$$h(x) = \frac{x + 4}{2x - 5}$$

$$h(x) \cdot (2x - 5) = x + 4$$

$$2xh(x) - 5h(x) - x - 4 = 0$$

$$x(2h(x) - 1) = 4 + 5h(x)$$

$$x = \frac{4 + 5h(x)}{2h(x) - 1}$$

So the inverse of $h(x) = \frac{x + 4}{2x - 5}$ is

$$f(x) = h^{-1}(x) = \frac{4 + 5x}{2x - 1}$$

Answer: $h^{-1}(x) = \frac{4 + 5x}{2x - 1}$.