

Answer to Question #87284 – Math – Calculus
Question

1. Find the derivative $f(x) = 2x^2 - 16x + 35$ by using first principle

- a. $x + 16$
- b. $4x - 16$
- c. $3x - 5$
- d. $2x - 8$

Solution

$$\begin{aligned} \frac{df(x)}{dx} &= \frac{d}{dx}(2x^2 - 16x + 35) \\ &= 4x - 16 \end{aligned}$$

Right option is B.

Question

2. Differentiate $y = 3\sqrt{x^2(2x - x^2)}$ with respect to x

- a. $y = 10x^{2/3} - 8x^{5/3}$
- b. $y = 10x^{2/3} + 8x^{5/3}$
- c. $y = 5x^{2/3} - 4x^{5/3}$
- d. $y = 5x^{2/3} + 4x^{5/3}$

Solution

$$\begin{aligned} \frac{dy}{dx} &= \frac{d}{dx}\{3\sqrt{x^2(2x - x^2)}\} \\ \frac{dy}{dx} &= 3\frac{d}{dx}\{(2x^3 - x^4)^{1/2}\} \\ &= \frac{3}{2}(2x^3 - x^4)^{-1/2}\{6x^2 - 4x^3\} \end{aligned}$$

Question

3. Evaluate the limit

- a. 12
- b. 8
- c. 14
- d. 6

Solution

Here the function is $\frac{(3+h)^2 - 18}{h}$

Take the limit of h approach to 0

When do that, denominator is 0 and ultimately answer is infinity

Thus apply L hospital rule. Independently differential numerator and denominator wrt to h

Thus function become

$$= \frac{2(3+h) - 0}{1}$$

Now take limit h tends to zero

$$=2(3+0)$$

$$=6$$

The answer is d.