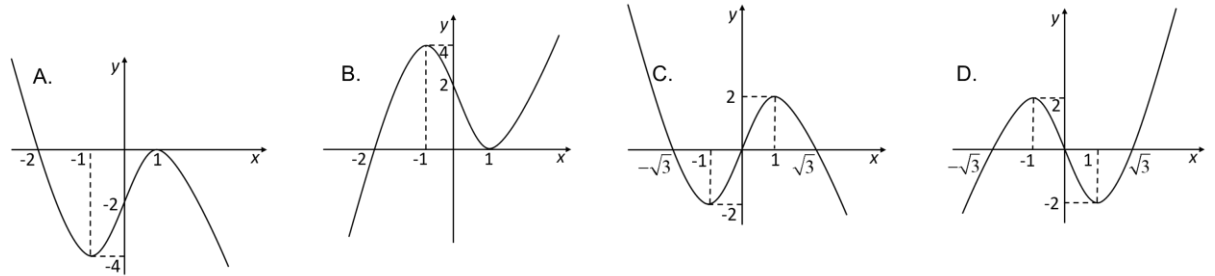


CALCULUS 14: QUIZ SOLUTIONS

Question 1

Which of the following graphs represents the function $f(x) = -x^3 + 3x - 2$?

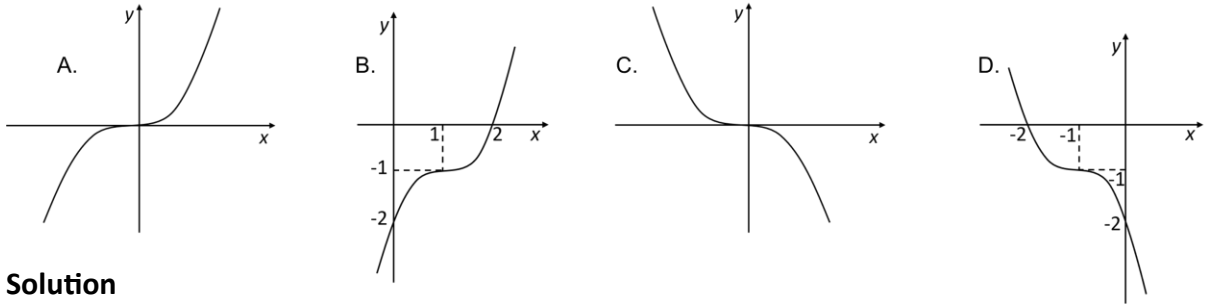


Solution

The correct answer is A.

Question 2

Which of the following graphs represents the function $f(x) = (x - 1)^3 - 1$?

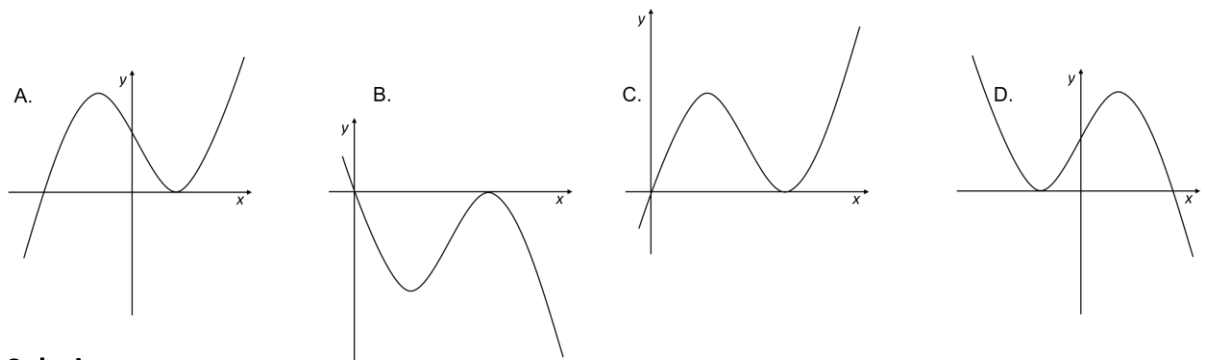


Solution

The correct answer is B.

Question 3

Which of the following graphs represents the function $f(x) = x^3 - 12x^2 + 36x$?

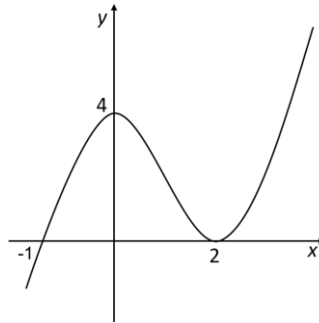


Solution

The correct answer is C.

Question 4

Here is the graph of the function $f(x) = x^3 + ax^2 + bx + c$.



What are the values of a , b and c ?

A. $a=1, b=6, c=0$

B. $a=4, b=2, c=4$

C. $a=0, b=4, c=2$

D. $a=-3, b=0, c=4$

Solution

$$f(x) = x^3 + ax^2 + bx + c$$

$$f(0) = 0 + 0 + 0 + c = 4$$

$$\therefore c = 4$$

$$f(-1) = (-1)^3 + a(-1)^2 + b(-1) + 4 = 0$$

$$\therefore a - b = -3 \quad (1)$$

$$f(2) = (2)^3 + a(2)^2 + b(2) + 4 = 0$$

$$\therefore 4a + 2b = -12$$

$$\therefore 2a + b = -6 \quad (2)$$

$$(1)+(2): 3a = -9$$

$$\therefore a = -3$$

$$\text{Substitute in (1): } (-3) - b = -3$$

$$\therefore b = 0$$

So, the correct answer is D.

Question 5

If $f(x) = x^3 - 3x + 2$, what is $g(x)$ if $g(x) = f(x-1)$?

A. $g(x) = x^3 + 3x^2 - 3x + 1$

B. $g(x) = x^3 - 3x^2 + 4$

C. $g(x) = x^3 - 3x^2 + 3x - 1$

D. $g(x) = x^3 + 3x^2 - 2$

Solution

$$f(x) = x^3 - 3x + 2$$

$$\therefore f(x-1) = (x-1)^3 - 3(x-1) + 2$$

$$= x^3 - 3x^2 + 3x - 1 - 3x + 3 + 2$$

$$= x^3 - 3x^2 + 4$$

$$= g(x)$$

So, the correct answer is B.