ALGEBRA 4: QUIZ SOLUTIONS

Question 1

Which one of the following expressions is not a polynomial?

A. $3x^2+4x-1$ B. $2x+7$ C. $4x^3+x^2-21$ D. $\frac{3}{x^2}+\frac{4}{x}-1$

Solution

A. $3x^2+4x-1$ is a polynomial.

B. $2x+7$ is a polynomial.

C. $4x^3+x^2-21$ is a polynomial.

D. $\frac{3}{x^2}+\frac{4}{x}-1$ is not a polynomial.

So, the correct answer is D.

Question 2

Factorise completely x^3-3x^2-28x.

A. $x(x^2-3x-28)$ B. $x(x-7)(x+4)$ C. $x(x+7)(x-4)$ D. $x(x+14)(x-2)$

Solution

$$\begin{aligned} & x^3-3x^2-28x \\ &= x(x^2-3x-28) \\ &= x(x-7)(x+4) \end{aligned}$$

So, the correct answer is B.

Question 3

Factorise completely $3x^3-81$.

A. $3(x-3)(x^2+3x+9)$ B. $3(x+3)(x^2-3x+9)$ C. $(x-3)(3x^2+9x+27)$

D. $3(x^3-27)$

Solution

$$\begin{aligned} & 3x^3-81 \\ &= 3(x^3-27) \\ &= 3(x^3-3^3) \\ &= 3(x-3)(x^2+3x+9) \end{aligned}$$

So, the correct answer is A.

Question 4

Factorise completely $x^3 - 19x - 30$.

A. $(x+2)(x+5)(x-3)$ B. $(x-2)(x-5)(x+3)$ C. $(x+2)(x-5)(x+3)$

D. $(x-2)(x+5)(x-3)$

Solution

$$\text{Let } f(x) = x^3 - 19x - 30$$
$$\therefore f(-2) = (-2)^3 - 19(-2) - 30 = 0$$
$$\therefore (x+2) \text{ is a factor of } f(x)$$
$$x^3 - 19x - 30 = (x+2)(x^2 - 2x - 15)$$
$$= (x+2)(x+3)(x-5)$$

So, the correct answer is C.

Question 5

Factorise completely $4x^3 + 8x^2 + 5x + 1$.

A. $(x-1)(2x-1)^2$ B. $(x+1)(2x+1)^2$ C. $(x+1)^2(2x+1)$

D. $(x-1)^2(2x-1)$

Solution

$$\text{Let } f(x) = 4x^3 + 8x^2 + 5x + 1$$
$$\therefore f(-1) = 4(-1)^3 + 8(-1)^2 + 5(-1) + 1 = 0$$
$$\therefore (x+1) \text{ is a factor of } f(x)$$
$$\therefore 4x^3 + 8x^2 + 5x + 1 = (x+1)(4x^2 + 4x + 1)$$
$$= (x+1)(2x+1)(2x+1)$$
$$= (x+1)(2x+1)^2$$

So, the correct answer is B.