

Answer on Question #56104 – Math - Algebra

Question 1. 6: How many solutions over the complex number system does this polynomial have?

$$2x^4 - 3x^3 - 24x^2 + 13x + 12 = 0$$

Enter your answer as an integer.

Answer: _____

Solution

Answer: 4

(Polynomials of degree n have exactly n roots over complex numbers, thus the polynomial of degree 4 has 4 roots)

Question 2. 7: The value 4 is an upper bound for the zeros of the function shown below.

$$f(x) = 4x^3 - 12x^2 - x + 15$$

A: True

B: False

Solution

The correct answer is "A: True". (Polynomials of degree n have exactly n roots over complex numbers, thus the polynomial of degree 4 has 4 roots)

Question 3. 8. The value 0 is a lower bound for the zeros of the function shown below.

$$f(x) = -3x^3 + 20x^2 - 36x + 16$$

A: True

B: False

Solution

The correct answer is "A: True"

(Polynomial of degree 4 has 4 roots, which is greater than 0)

Question 4. 9: Express the polynomial as a product of linear factors.

$$f(x) = 2x^3 + 4x^2 - 2x - 4$$

A: $(x-4)(x+1)(x-1)$

B: $(x-2)(x-2)(x-1)$

C: $2(x+2)(x+1)(x-1)$

D: $(x-2)(x+1)(x-1)$

Solution.

The correct answer is "C: $2(x+2)(x+1)(x-1)$ "

(Multiplying 2 by $(x+2)$ by $(x+1)$ by $(x-1)$ we obtain $2x^3 + 4x^2 - 2x - 4$.)

Question 5. 10: What is the sum of the roots of the polynomial shown below?

$$f(x) = x^3 + 2x^2 - 11x - 12$$

Answer: _____

Solution.

Answer: -2. (Sum of the roots equals to the coefficient of x^2 taken with opposite sign: -2).