Algebra Test 1: Polynomials and Factorization

INSTRUCTIONS: ANSWER ALL QUESTIONS.

Question 1: Polynomial Operations

What is the result of the following operation: $(2x^2 + 3x - 5) + (4x^2 - 2x + 6)$?

A) $6x^2 + x + 1$

B) $6x^2 + 5x + 1$

C) $6x^2 + x - 1$

D) $6x^2 + 5x + 0$

Question 2: Polynomial Operations

What is the result of the expression: $(5x^3 - 2x^2 + 4) - (3x^3 + x^2 - 2)$?

A) $2x^3 - 3x^2 + 6$

B) $2x^3 - x^2 + 6$

C) $2x^3 - 3x^2 + 2$

D) $2x^3 + 3x^2 + 2$

Question 3: Multiplication of Polynomials

What is the product of the following polynomials: $(2x - 3)(x + 4)$?

A) $2x^2 + 5x - 12$

B) $2x^2 - 5x - 12$

C) $2x^2 + 5x + 12$

D) $2x^2 - 5x + 12$

Question 4: Division of Polynomials

What is the result of dividing the polynomial $6x^3 + 11x^2 - 5x - 10$ by $3x + 2$?

A) $2x^2 + 3x - 5$

B) $2x^2 + 5x - 5$

C) $2x^2 + 3x + 5$

D) $2x^2 - 5x + 5$

Question 5: Factorization

Which of the following is a factor of the polynomial $x^3 - 6x^2 + 11x - 6$?

A) $(x - 1)$

B) $(x - 2)$

C) $(x - 3)$

D) $(x - 4)$

Question 6: Remainder Theorem

What is the remainder when the polynomial $p(x) = x^3 - 3x^2 + 4x - 5$ is divided by $x - 1$?

A) -3

B) 0

C) 1

D) 5

Question 7: Factor Theorem

Using the Factor Theorem, which of the following expressions is a factor of the polynomial

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

A) $(x - 1)$

B) $(x - 2)$

C) x

D) $(2x - 1)$

Question 8: Evaluating Unknown Coefficients

If $p(x) = x^3 + ax^2 + bx + 6$ has a root at $x = -1$, what is the value of $a + b$?

A) -7

B) -6

C) -5

D) -4

Question 9: Factorization of Quadratic Expressions

Factor the quadratic expression: $x^2 + 5x + 6$.

A) $(x + 2)(x + 3)$

B) $(x + 1)(x + 6)$

C) $(x - 2)(x - 3)$

D) $(x + 4)(x + 2)$

Question 10: Division of a Polynomial by Linear Factor

What is the remainder of $p(x) = x^2 + 4x + 4$ when divided by $x + 2$?

A) 0

B) 2

C) 4

D) -4

END OF ASSESSMENT