

Algebra 1 - Adding, Subtracting and Multiplying Polynomials - Test Answer Key

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These are worked solutions for the polynomial operations test with a scoring guide for every question. Award points for correct method as well as for the final answer. The test totals 20 points, so add the question scores to find the final grade.

Algebra 1 · Common Core State Standards: **A-APR.A.1**

Question 1 - Name polynomials [2 pts]

$4x^4 - 7x + 1$ is a trinomial of degree 4. $9x^2$ is a monomial of degree 2.

trinomial, 4; monomial, 2

Scoring: 1 point for each polynomial (name and degree both correct).

Question 2 - Add polynomials [2 pts]

Combine like terms: $(6-2)x^2 + (-3+5)x + (2-7)$.

$$4x^2 + 2x - 5$$

Scoring: 1 point for two correct terms; 1 point for the full answer.

Question 3 - Subtract polynomials [2 pts]

Distribute the negative: $4x^2 - x + 9 - x^2 - 6x + 3$.

$$3x^2 - 7x + 12$$

Scoring: 1 point for distributing the negative correctly; 1 point for the answer.

Question 4 - Monomial times polynomial [2 pts]

$$2x \cdot x^2 = 2x^3, 2x \cdot (-4x) = -8x^2, 2x \cdot 3 = 6x.$$

$$2x^3 - 8x^2 + 6x$$

Scoring: 1 point for two correct terms; 1 point for the full answer.

Question 5 - Binomial product [2 pts]

$$x^2 - 2x + 5x - 10.$$

$$x^2 + 3x - 10$$

Scoring: 1 point for the four partial products; 1 point for combining like terms.

Question 6 - FOIL with coefficients [2 pts]

	2x	5
3x	6x ²	15x
-2	-4x	-10

Partial products.

First $6x^2$, Outer $15x$, Inner $-4x$, Last -10 .

$$6x^2 + 11x - 10$$

Scoring: 1 point for the partial products; 1 point for the final polynomial.

Question 7 - Special products [3 pts]

a) $x^2 + 18x + 81$.

b) $x^2 - 36$.

c) Squaring means multiplying the binomial by itself. The products $9x$ and $9x$ produce the middle term $18x$.

$$x^2 + 18x + 81; x^2 - 36$$

Scoring: 1 point per part.

Question 8 - Rectangle area [3 pts]

	x	2
x	x^2	$2x$
7	$7x$	14

Partial products.

a) $(x+7)(x+2) = x^2 + 2x + 7x + 14 = x^2 + 9x + 14$.

b) $9 + 27 + 14 = 50$, and also $(10)(5) = 50$.

$x^2 + 9x + 14$; **50**

Scoring: part a, 1 point for the partial products and 1 point for combining; part b, 1 point.

Question 9 - Closure [2 pts]

Add: $5x^2$, a polynomial.

It illustrates that polynomials are closed under addition: the sum of two polynomials is always a polynomial.

$5x^2$

Scoring: 1 point for the sum; 1 point for the closure statement.

Total**20 points**