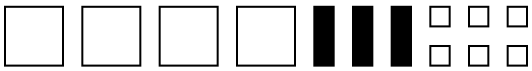
**Name:** _____ **Class:** _____ **Date:** _____ **ID: A**

# Math 9 Unit 5 Polynomials Practice Test

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. A large white square represents an $x^2$-tile, a black rectangle represents a $-x$-tile, and a small white square represents a 1-tile.

Write the polynomial represented by this set of algebra tiles.



a. $4x^2 - x^3 + 6$ b. $-4x^2 + 3x + 6$ c. $4x - 3x^2 + 6$ d. $4x^2 - 3x + 6$

____ 2. Identify the polynomials that can be represented by the same set of algebra tiles.

i) $3x^2 - 5 + 2x$
ii) $3x^2 - 2x + 5$
iii) $-5 + 2x - 3x^2$
iv) $2x - 5 + 3x^2$

a. iii and iv b. i and ii c. i and iv d. ii and iv

____ 3. Combine like terms. Sketch algebra tiles if it helps.

$10x^2 - 7x + 3x - 8x^2$

a. $2x^2 + 4x$ b. $-2x^2$ c. $2x^2 - 4x$ d. $3x^2 - 5x$

____ 4. Add: $(4x^2 - 5) + (5x^2 - 9x - 7)$

a. $9x^2 - 9x + 12$
b. $9x^2 - 9x - 12$
c. $20x^2 - 9x - 35$
d. $9x^2 - 14x - 7$

____ 5. Subtract: $(2r^2 - 3) - (5r^2 + 8r + 8)$

a. $3r^2 - 8r - 11$
b. $-3r^2 + 8r + 5$
c. $3r^2 + 8r + 5$
d. $-3r^2 - 8r - 11$

____ 6. Divide: $\dfrac{15w^2 - 12w + 9}{3}$

a. $5w^2 - 4w + 3$
b. $12w^2 - 9w + 6$
c. $12w^2 - 12w + 9$
d. $5w^2 - 12w + 9$

____ 7. A large white square represents an $x^2$-tile, a white rectangle represents an $x$-tile, and a small white square represents a 1-tile.

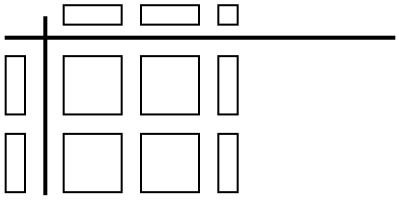
Which of these multiplication sentences is modelled by the algebra tiles below?

i) $2x(2x+1)$

ii) $2(2x^2+1)$

iii) $x(2x+1)$

iv) $2x(4x^2+2x)$



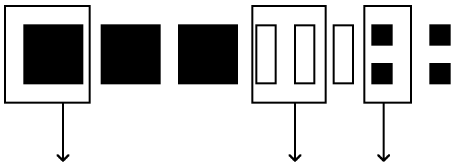
a. iv b. ii c. i d. iii

____ 8. Multiply: $(-q)(5p-8q)$

a. $-5pq+8q^2$ b. $5p+9q$ c. $4pq-9q^2$ d. $-5pq-8q$

____ 9. A large black square represents a $-x^2$-tile, a white rectangle represents an $x$-tile, and a small black square represents a $-1$-tile.

Write the subtraction sentence that these algebra tiles represent.



a. $(3x^2-3x+4)-(-x^2+2x-2)$

b. $(-3x^2+3x-4)-(-x^2-2x-2)$

c. $(-x^2+2x-2)-(-3x^2+3x-4)$

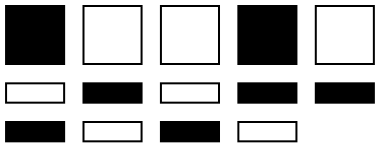
d. $(-3x^2+3x-4)-(-x^2+2x-2)$

**Short Answer**

10. Name the coefficients, variable, degree, and constant term in the polynomial $4x^2-8x+6$.

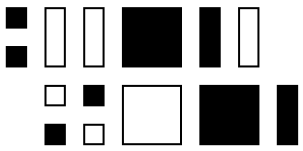
11. A large white square represents an $x^2$-tile, a large black square represents a $-x^2$-tile, a white rectangle represents an $x$-tile, and a black rectangle represents a $-x$-tile.

    Write the simplified polynomial.



12. A large white square represents an $x^2$-tile, a large black square represents a $-x^2$-tile, a white rectangle represents an $x$-tile, a black rectangle represents a $-x$-tile, a small white square represents a 1-tile, and a small black square represents a $-1$-tile.

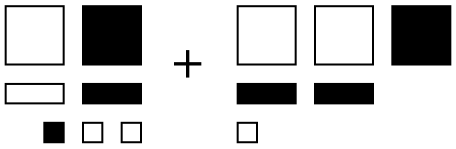
    Write the simplified polynomial.



13. Group like terms, then simplify.
    $4 + 3x - 6 + 5x^2 + 2x - 5x^2 + 3 - 5x$

14. A large white square represents an $x^2$-tile, a large black square represents a $-x^2$-tile, a white rectangle represents an $x$-tile, a black rectangle represents a $-x$-tile, a small white square represents a 1-tile, and a small black square represents a $-1$-tile.

    Write the polynomial sum modelled by this set of tiles.



15. Subtract: $(8y^2 - 2x^2 + 5x - 11) - (5y^2 - 6x^2 - 9x - 10)$

16. Here is a student's solution for this question:

$(12x^2 - 15x - 3) \div (-3)$

$= \frac{12x^2}{-3} + (\frac{-15x}{-3}) + (\frac{-3}{-3})$

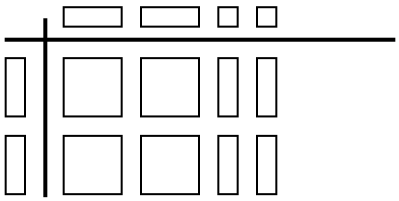
$= -4x^2 + (-5x) + (-0)$

$= -4x^2 - 5x$

Identify the errors in the solution.

17. A large white square represents an $x^2$-tile, a white rectangle represents an $x$-tile, and a small white square represents a 1-tile.

Write a division sentence that is modelled by these algebra tiles.



18. Determine the product: $(-4x)(5x + 6y - 4z)$

**Problem**

19. A box contains 4 $x$-tiles, 2 $-x$-tiles, 5 $y$-tiles, 10 $-y$-tiles, and 5 $-1$-tiles.
Write the polynomial represented by these tiles, then simplify.

20. Create a polynomial that is added to $5x^2 + 6x + 9$ to get $7x^2 + 9x + 14$.
Explain how you found your answer.

21. Divide: $\frac{10x^2 - 45x + 75y - 250y^2}{5}$

Show your work.

# Math 9 Unit 5 Polynomials Practice Test
# Answer Section

## MULTIPLE CHOICE

1. ANS: D PTS: 1 DIF: Easy REF: 5.1 Modelling Polynomials
   LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
   KEY: Conceptual Understanding
2. ANS: C PTS: 1 DIF: Moderate REF: 5.1 Modelling Polynomials
   LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
   KEY: Procedural Knowledge
3. ANS: C PTS: 1 DIF: Easy REF: 5.2 Like Terms and Unlike Terms
   LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
   KEY: Procedural Knowledge
4. ANS: B PTS: 1 DIF: Moderate REF: 5.3 Adding Polynomials
   LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
   KEY: Procedural Knowledge
5. ANS: D PTS: 1 DIF: Moderate REF: 5.4 Subtracting Polynomials
   LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
   KEY: Procedural Knowledge
6. ANS: A PTS: 1 DIF: Moderate
   REF: 5.5 Multiplying and Dividing a Polynomial by a Constant
   LOC: 9.PR7 TOP: Patterns and Relations (Variables and Equations)
   KEY: Procedural Knowledge
7. ANS: C PTS: 1 DIF: Easy
   REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial
   LOC: 9.PR7 TOP: Patterns and Relations (Variables and Equations)
   KEY: Procedural Knowledge
8. ANS: A PTS: 1 DIF: Moderate
   REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial
   LOC: 9.PR7 TOP: Patterns and Relations (Variables and Equations)
   KEY: Procedural Knowledge
9. ANS: D PTS: 1 DIF: Easy REF: 5.4 Subtracting Polynomials
   LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
   KEY: Procedural Knowledge

## SHORT ANSWER

10. ANS:
    Coefficients: 4, –8
    Variable: $x$
    Degree: 2
    Constant term: 6

    PTS: 1 DIF: Moderate REF: 5.1 Modelling Polynomials
    LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
    KEY: Conceptual Understanding

11. ANS:
$x^2 - x$

PTS: 1 DIF: Moderate REF: 5.2 Like Terms and Unlike Terms
LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
KEY: Procedural Knowledge

12. ANS:
$-x^2 + x - 2$

PTS: 1 DIF: Moderate REF: 5.2 Like Terms and Unlike Terms
LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
KEY: Procedural Knowledge

13. ANS:
$5x^2 - 5x^2 + 3x + 2x - 5x + 4 - 6 + 3$
$= 1$

PTS: 1 DIF: Difficult REF: 5.2 Like Terms and Unlike Terms
LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
KEY: Procedural Knowledge

14. ANS:
$x^2 - 2x + 2$

PTS: 1 DIF: Moderate REF: 5.3 Adding Polynomials
LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
KEY: Procedural Knowledge

15. ANS:
$3y^2 + 4x^2 + 14x - 1$

PTS: 1 DIF: Difficult REF: 5.4 Subtracting Polynomials
LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
KEY: Procedural Knowledge

16. ANS:
Errors:
$\frac{-15x}{-3} = +5x$, not $-5x$
$\frac{-3}{-3} = +1$, not 0

PTS: 1 DIF: Moderate
REF: 5.5 Multiplying and Dividing a Polynomial by a Constant
LOC: 9.PR7 TOP: Patterns and Relations (Variables and Equations)
KEY: Conceptual Understanding | Communication

17. ANS:
$(4x^2 + 4x) \div 2x = 2x + 2$

PTS: 1 DIF: Easy
REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial
LOC: 9.PR7 TOP: Patterns and Relations (Variables and Equations)
KEY: Procedural Knowledge

18. ANS:
$-20x^2 - 24xy + 16xz$

PTS: 1 DIF: Difficult
REF: 5.6 Multiplying and Dividing a Polynomial by a Monomial
LOC: 9.PR7 TOP: Patterns and Relations (Variables and Equations)
KEY: Procedural Knowledge

**PROBLEM**

19. ANS:
$4x - 2x + 5y - 10y - 5$

$= 2x - 5y - 5$

PTS: 1 DIF: Moderate REF: 5.2 Like Terms and Unlike Terms
LOC: 9.PR5 TOP: Patterns and Relations (Variables and Equations)
KEY: Problem-Solving Skills

20. ANS:
To get $7x^2$, I add $2x^2$.
To get $9x$, I add $3x$.
To get 14, I add 5.
So, the polynomial to add to $5x^2 + 6x + 9$ to get $7x^2 + 9x + 14$ is $2x^2 + 3x + 5$.

PTS: 1 DIF: Difficult REF: 5.3 Adding Polynomials
LOC: 9.PR6 TOP: Patterns and Relations (Variables and Equations)
KEY: Problem-Solving Skills | Communication

21. ANS:

$$\frac{10x^2 - 45x + 75y - 250y^2}{5}$$

$$= \frac{10x^2}{5} + \frac{-45x}{5} + \frac{75y}{5} + \frac{-250y^2}{5}$$

$$= 2x^2 + (-9x) + 15y + (-50y^2)$$

$$= 2x^2 - 9x + 15y - 50y^2$$

PTS: 1 DIF: Difficult
REF: 5.5 Multiplying and Dividing a Polynomial by a Constant
LOC: 9.PR7 TOP: Patterns and Relations (Variables and Equations)
KEY: Problem-Solving Skills