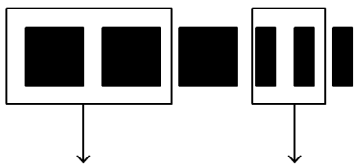


## Math 9 - Final Review - Unit 5

1. A large black square represents a  $-x^2$ -tile and a black rectangle represents a  $-x$ -tile.

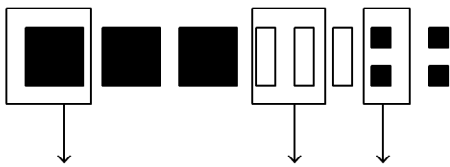
Write the subtraction sentence that these algebra tiles represent.



- A  $(-2x^2 - 3x) - (-3x^2 - 2x)$                       C  $(-2x^2 - 2x) - (-3x^2 - 3x)$   
 B  $(-3x^2 - 2x) - (-2x^2 - 3x)$                       D  $(-3x^2 - 3x) - (-2x^2 - 2x)$

2. 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.

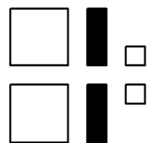
Write the subtraction sentence that these algebra tiles represent.



- A  $(3x^2 - 3x + 4) - (-x^2 + 2x - 2)$                       C  $(-x^2 + 2x - 2) - (-3x^2 + 3x - 4)$   
 B  $(-3x^2 + 3x - 4) - (-x^2 - 2x - 2)$                       D  $(-3x^2 + 3x - 4) - (-x^2 + 2x - 2)$

3. 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.

What polynomial does this collection of algebra tiles represent?



4. Which of the following expressions are polynomials?

- i)  $x^3 - 3x + 5$   
 ii)  $\frac{5}{x^2} + \frac{1}{x} + 7$   
 iii)  $\sqrt{2x^2 + 6x}$   
 iv)  $7 - x$

5. Is each expression a monomial, binomial, or trinomial?

- a)  $5x^2 - 2x$
- b)  $4x^2$
- c)  $4 - 6x + 5x^2$
- d)  $2x^2 - 7$
- e)  $4x^3 - 8x$

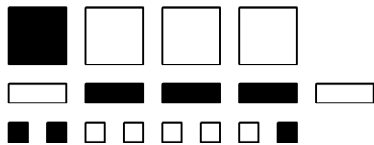
6. Name the coefficients, variable, degree, and constant term in the polynomial  $4x^2 - 6x + 8$ .

7. 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.

Sketch algebra tiles to model the polynomial  $6 - 4v^2 + v$ .

8. 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.



9. Combine like terms. Sketch algebra tiles if it helps.

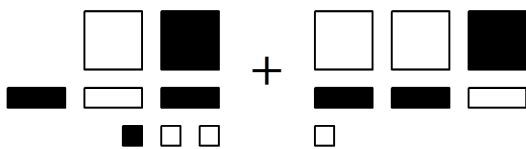
$$3x^2 - 6x + 4x^2 + 3x - 6$$

10. Group like terms, then simplify.

$$3 + 5x - 7 + 6x^2 + 2x - 6x^2 + 5 - 7x$$

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, 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.



12. Add:  $(10x^2 - 7x + 6) + (-2x^2 + 2x - 9)$

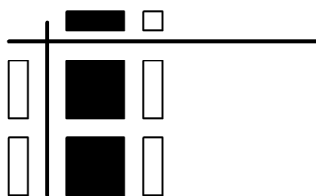
13. Subtract:  $(-9x - 8) - (-11x - 5)$

14. Subtract:  $(7x^2 - 6) - (4x^2 - 11x + 3)$

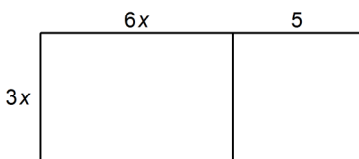
15. Subtract:  $(4x^2 + 9x - 3) - (x^2 - 11x + 5)$

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

Write the multiplication sentence that is modelled by these algebra tiles.



17. Write the multiplication sentence modelled by this rectangle.



18. Divide:  $\frac{18m - 30m^2}{-6m}$

19. Multiply:  $(3r - 4s)(-5s)$

20. Divide:  $(-20x^2 + 25xy) \div 5x$

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

22. Determine the quotient:  $(-10x^2 + 4xy - 6xz) \div (-2x)$

23. 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.

Match each polynomial with its corresponding algebra tile model.

- i)  $3 - 2t + 4t^2$
- ii)  $3a^2 - 6$
- iii)  $4s - 7 - 2s^2$
- iv)  $5m^2$
- v)  $-3p + 8$
- vi)  $-4c^2 + 6c - 2$

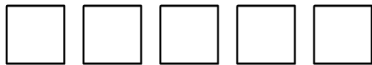
Model A



Model B



Model C



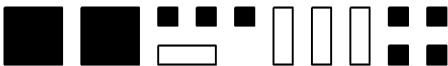
Model D



Model E



Model F



24. Subtract:  $(9x^2 + 6x) + (5x + 9) - (5x^2 - 4x - 12)$   
Show your work.

**25.** A student subtracted like this:

$$\begin{aligned}(8x^2 - 3x + 7) - (5x^2 + 5x - 5) \\= 8x^2 - 3x + 7 - 5x^2 + 5x - 5 \\= 8x^2 - 5x^2 - 3x + 5x + 7 - 5 \\= 3x^2 + 2x + 2\end{aligned}$$

- a) Explain why the solution is incorrect.
- b) What is the correct answer? Show your work.

**26.** Simplify:  $[(3x^2 + 5xy) - (6x^2 - 4xy)] \div 4x$ .

## Math 9 - Final Review - Unit 5

### Answer Section

#### MULTIPLE CHOICE

1. D
2. D

#### SHORT ANSWER

3.  $2x^2 - 2x + 2$
4. i and iv
5. a) Binomial  
b) Monomial  
c) Trinomial  
d) Binomial  
e) Binomial
6. Coefficients: 4, -6  
Variable:  $x$   
Degree: 2  
Constant term: 8



- 7.
8.  $2x^2 - x + 2$
9.  $7x^2 - 3x - 6$
10.  $6x^2 - 6x^2 + 5x + 2x - 7x + 3 - 7 + 5$   
 $= 1$
11.  $x^2 - 2x + 2$
12.  $8x^2 - 5x - 3$
13.  $2x - 3$
14.  $3x^2 + 11x - 9$
15.  $3x^2 + 20x - 8$
16.  $2x(-x + 1) = -2x^2 + 2x$
17.  $3x(6x + 5) = 18x^2 + 15x$
18.  $-3 + 5m$
19.  $-15rs + 20s^2$
20.  $-4x + 5y$
21.  $-24x^2 - 20xy + 20xz$
22.  $5x - 2y + 3z$

23. Model A: v  
 Model B: vi  
 Model C: iv  
 Model D: i  
 Model E: ii  
 Model F: iii

**PROBLEM**

24.  $(9x^2 + 6x) + (5x + 9) - (5x^2 - 4x - 12)$   
 $= 9x^2 + 6x + 5x + 9 - 5x^2 + 4x + 12$   
 $= 9x^2 - 5x^2 + 6x + 5x + 4x + 9 + 12$   
 $= (9 - 5)x^2 + (6 + 5 + 4)x + (9 + 12)$   
 $= 4x^2 + 15x + 21$

25. a) The student did not change the signs of  $+5x$  and  $-5$  after removing the second pair of brackets.

b) Correction:

$$(8x^2 - 3x + 7) - (5x^2 + 5x - 5)$$

$$= 8x^2 - 3x + 7 - 5x^2 - 5x + 5$$

$$= 8x^2 - 5x^2 - 3x - 5x + 7 + 5$$

$$= 3x^2 - 8x + 12$$

26.  $[(3x^2 + 5xy) - (6x^2 - 4xy)] \div 4x$   
 $= [3x^2 + 5xy - 6x^2 + 4xy] \div 4x$   
 $= [-3x^2 + 9xy] \div 4x$   
 $= \frac{-3x^2}{4x} + \frac{9xy}{4x}$   
 $= \frac{-3x}{4} + \frac{9y}{4}$