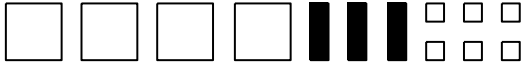


Unit 5 – Polynomials

Grade 9 Mathematics Exam Review

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.



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

How would you model the polynomial $-3x^2 - 4$ with algebra tiles?

3. Which of the following expressions are polynomials?

- i) $\frac{1}{2}x$
- ii) $1 - 7.5x^2$
- iii) $2\sqrt{x}$
- iv) 5.5

4. How many terms are in the polynomial $8x^2 + 4x - 9$?

5. Which of the following expressions is a binomial with degree 2?

- i) $x^2 - 10x + 5$
- ii) $3x^2$
- iii) $7x^2 - 2x$
- iv) $\frac{1}{x^2} - 7$

6. Which of the following expressions are monomials with degree 2?

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

7. Name the coefficients of the variable in the polynomial $-5x^2 + 13x - 15$.

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

- i) $4x^2 - 5 + 6x$
- ii) $4x^2 - 6x + 5$
- iii) $-5 + 6x - 4x^2$
- iv) $6x - 5 + 4x^2$

9. Identify the polynomial that is equivalent to $5 - 3v - 4v^2$.

i) $4v^2 + 3v - 5$

ii) $5 + 4v^2 - 3v$

iii) $-4v^2 - 3v + 5$

iv) $-4v^2 - 5 + 3v$

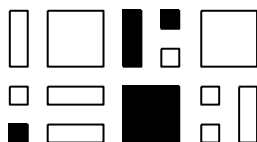
10. What algebra tiles would you use to model the polynomial $7 - 5x^2 + 4x$?

11. Combine like terms. Sketch algebra tiles if it helps.
 $5x + 10 + 7x - 3$

12. Combine like terms. Sketch algebra tiles if it helps.
 $10x^2 - 8x + 2x - 6x^2$

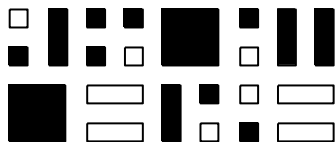
13. A large white square represents an x^2 -tile, a large black square represents a $-x^2$ -tile, a white rectangle represents an x -tile, a black rectangle represents a $-x$ -tile, a small white square represents a 1-tile, and a small black square represents a -1 -tile.

Write the simplified polynomial.



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 simplified polynomial.



15. Simplify: $8x + 4 - 5 + 3x$

16. From the list, which terms are like $7x$?
 $7x^2, 8x, 6, -8x, -7x, 7x^2, 7$

17. From the list, which terms are like $-7x^2$?
 $7x^2, 7x, 2x^2, -7, -5, -7x, -4x^2$

18. Combine like terms. Sketch algebra tiles if it helps.
 $3x^2 - 5 - 6x - 9x^2 + 7$

19. Simplify: $6x + 8x - 2x + 4x + 5$

20. Simplify: $11x^2 - 10 + 5x + 4 - 3x^2 - 8x$

21. Add the polynomials. Visualize algebra tiles if it helps.

$$\begin{array}{r} 6x - 4 \\ + -10x + 9 \\ \hline \end{array}$$

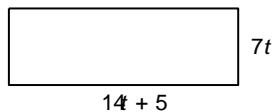
22. Add: $(6x - 5) + (3x + 7)$

23. Add: $(8x - 6) + (-6x - 3)$

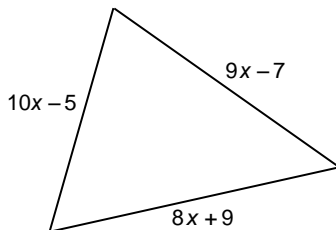
24. Add: $(-4x - 7) + (5 - 2x)$

25. Add: $(2x^2 - 6) + (5x^2 - 8x - 4)$

26. Write the perimeter of this rectangle as a polynomial in simplest form.



27. Write the perimeter of this triangle as a polynomial in simplest form.



28. Add: $(3x^2 - 5x + 5) + (-x^2 - 2x - 5)$

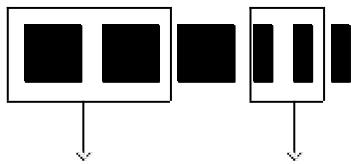
29. Add: $(-3x^2 + 3 - 7x) + (6 + x^2 + 10x)$

30. Add: $(8x^2 - 5x) + (-5 - 3x^2)$

31. Subtract: $(6x - 7) - (9x - 8)$

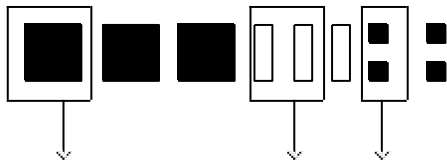
32. A large black square represents a $-x^2$ -tile and a black rectangle represents a $-x$ -tile.

Write the subtraction sentence that these algebra tiles represent.



33. 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.



34. Subtract: $(4p - 6) - (6 - 4p)$

35. Subtract: $(8t - 7) - (-8t - 7)$

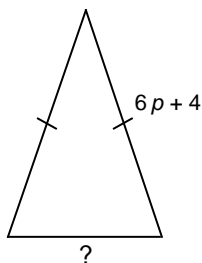
36. Subtract: $(4r^2 - 2) - (7r^2 + 6r + 9)$

37. Subtract: $(3 - 5c - 6c^2) - (2c - 3)$

38. Subtract: $(3x - 7x^2 + 3) - (3x^2 - 7 + 6x)$

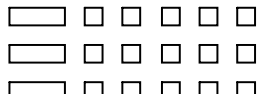
39. Subtract: $(3y^2 - 6x^2 + 4) - (2x - 8 + 4y^2)$

40. The perimeter of this isosceles triangle is represented by the polynomial $18p + 16$.
Write a simplified polynomial for the length of the unknown side.



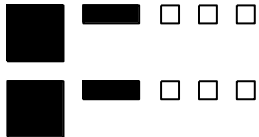
41. A white rectangle represents an x -tile and a small white square represents a 1-tile.

What is the multiplication sentence modelled by this set of algebra tiles?



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

What is the division sentence modelled by this set of algebra tiles?



43. Multiply: $5(4x)$

44. Multiply: $8(5x^2 - 2x)$

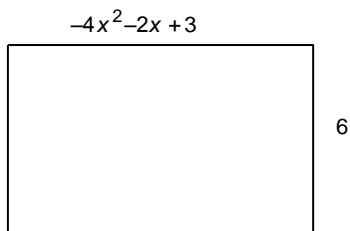
45. Divide: $\frac{10p - 14}{2}$

46. Divide: $20x^2 \div 5$

47. Divide: $\frac{20w^2 - 16w + 12}{4}$

48. Multiply: $(-4)(6c^2 - 5c - 7)$

49. Determine the area of this rectangle.

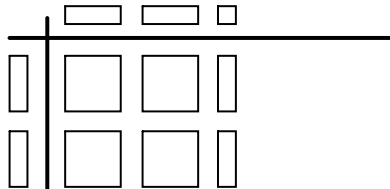


50. Divide: $\frac{-12y^2 - 6y - 9}{-3}$

51. 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.

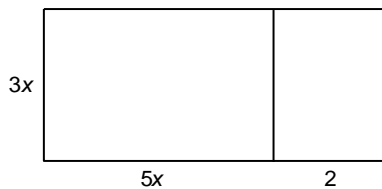
Which of these multiplication sentences is modelled by the algebra tiles below?

- i) $2x(2x + 5)$
- ii) $2(2x^2 + 5)$
- iii) $x(2x + 5)$
- iv) $2x(4x^2 + 10x)$



52. Which of these multiplication sentences is modelled by the rectangle below?

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



53. Multiply: $(-2w)(4w)$

54. Divide: $(9x^2) \div (-3x)$


55. Divide: $\frac{-16x^2}{4x^2}$

56. Multiply: $(4y - 5)(-y)$

57. Multiply: $-6c(2c - 5)$

58. Divide: $\frac{-20p^2 - 16p}{-4p}$

Unit 5 - Answer Key

1. $4x^2 - 3x + 6$
2. 
3. i, ii, and iv
4. 3
5. iii
6. ii and iii
7. -5, 13
8. i and iv
9. iii
10. 5 x^2 -tiles, 4 x -tiles, and 7 1-tiles
11. $12x + 7$
12. $4x^2 - 6x$
13. $x^2 + 3x + 2$
14. $-2x^2 - 2$
15. $11x - 1$
16. $8x, -8x, -7x$
17. $7x^2, 2x^2, -4x^2$
18. $-6x^2 - 6x + 2$
19. $16x + 5$
20. $8x^2 - 3x - 6$
21. $-4x + 5$
22. $9x + 2$
23. $2x - 9$
24. $-6x - 2$
25. $7x^2 - 8x - 10$
26. $42t + 10$
27. $27x - 3$
28. $2x^2 - 7x$
29. $-2x^2 + 3x + 9$
30. $5x^2 - 5x - 5$
31. $-3x + 1$
32. $(-3x^2 - 3x) - (-2x^2 - 2x)$
33. $(-3x^2 + 3x - 4) - (-x^2 + 2x - 2)$
34. $8p - 12$
35. $16t$
36. $-3r^2 - 6r - 11$
37. $-6c^2 - 7c + 6$
38. $-10x^2 - 3x + 10$
39. $-1y^2 - 6x^2 - 2x + 12$
40. $6p + 8$
41. $4(x + 5)$
42. $\frac{-2x^2 - 2x + 6}{2}$
43. $20x$
44. $40x^2 - 16x$
45. $5p - 7$
46. $4x^2$
47. $5w^2 - 4w + 3$
48. $-24c^2 + 20c + 28$
49. $-24x^2 - 12x + 18$
50. $4y^2 + 2y + 3$
51. i
52. iv
53. $-8w^2$
54. $-3x$
55. -4
56. $-4y^2 + 5y$
57. $-12c^2 + 30c$
58. $5p + 4$