

1.
 - Polynomials form a system similar to integers. Therefore, the system of polynomials is closed under addition, subtraction, and multiplication.
 - Polynomials are added or subtracted by combining like terms.
 - Polynomials can be multiplied by applying the Distributive Property or by using a table.
 - The greatest common factor of polynomials is the greatest common factor of the coefficients and the variables that are common factors of each term.
 - When a trinomial is in the form $x^2 + bx + c$, the factors are found by identifying factor pairs of c that have a sum of b . The factors are then used to write binomial factors that have a product equal to the trinomial.
 - A quadratic trinomial in the form $ax^2 + bx + c$ is factored by finding factor pairs of ac that have a sum of b . When ac and b are positive, the second terms in the binomial factors are also positive. When ac is negative, the second terms in the binomial factors have opposite signs.
2. Closure Property
3. perfect-square trinomial
4. monomial
5. difference of two squares
6. standard form of a polynomial
7. quadratic
8. constant
9. cubic
10. $7x - 4$
11. $-x^2 - 12x + 3$
12. $8b^4 + 8b^2 - 6$
13. $5x$; In the sum, the coefficient of the x term is 8. So far, there is only $3x$ in the addends, so there is $5x$ missing.

14. $5x^2 + 19x + 51$
15. $x^2 + 2x - 35$
16. $6x^2 - 13x - 5$
17. $20x^2 - 11xy - 3y^2$
18. $x^3 + x^2 - 13x - 4$
19. $x; 8$
20. $27x^3 - 27x^2 + 9x - 1$
21. $b^2 + 24b + 144$
22. $16x^2 + 8x + 1$
23. $36x^2 - 81$
24. $9x^2 - 16y^2$
25. $2.25x^2 - 4$
26. $9a^2 - 30ab + 25b^2$
27. 25
28. Surface area: $150x^2 - 120x + 24 \text{ ft}^2$, Volume: $125x^3 - 150x^2 + 60x - 8 \text{ ft}^3$
29. $3x$
30. bc
31. $7xy^2$
32. 6
33. $3x(5x^2 - 14)$
34. $6y(y^4 - 7y^2 + 3)$
35. $6a(2a^2 + 3a - 6)$

36. $7ab(7a^4 b^2 - 2ab + 5)$

37. Answers may vary. Sample: $9x^6 - 27x^3 + 6x$

38. $2x$; $2x(7x - 8)$

39. *Sample:*

Factors	Sum of Factors
-1 and 18	-17
1 and -18	17
-2 and 9	7

40. $(x + 8)(x + 4)$

41. $(x + 7)(x - 4)$

42. $(x + 3)(x - 16)$

43. $(x + 3y)(x + 15y)$

44. Both have the same factors of 7 and 3, but with different signs. The first expression has binomial factors $(x + 7)(x - 3)$ and the second expression has binomial factors $(x - 7)(x + 3)$.

45.

Factors	Sum of Factors
20 and 1	21
10 and 2	12
5 and 4	9

46.

Factors	Sum of Factors
-1 and 30	29
1 and -30	-29
-2 and 15	13
2 and -15	-13
-3 and 10	7
3 and -10	-7
-5 and 6	1
5 and -6	-1

47. $(3x + 4)(x + 2)$

48. $(4x + 5)(x - 2)$

49. $(5x - 3)(x + 2)$

50. $(3x + 2)(2x + 3)$

51. $(5x + 4)(2x - 1)$

52. $2(2x + 3)(3x + 1)$

53. 23, -23, 10, -10, 5, -5, 2, -2

54. $(2x - 1)$ m by $(x + 5)$ m. The new dimensions would be $(2x + 4)$ m by $(x + 10)$ m. The new area is $2x^2 + 24x + 40$ m².

55. 64

56. 98

57. $(x + 5)^2$

58. $(x + 11)(x - 11)$

59. $(x - 9)^2$

60. $(3x + 7y)(3x - 7y)$

61. $3(x + 3)^2$

62. $3(x - 7)^2$

63. No; 3 is not a perfect square, so it is not a difference of two squares. Also, $3x^2$ and 49 share no common factor.

64. The playground is $(6x + 4y)$ ft long and $(6x - 4y)$ ft wide. The length is $8y$ ft longer than the width. You would need to subtract $4y$ from the length and add $4y$ to the width for the playground to be a square.