Evaluate.

1. \(a^3 - a^2 + 3a\) for \(a = -2\)
2. \(\frac{5x^2 - 5}{2y}\) for \(x = 1\) \(y = 3\)
3. \(-\frac{5^2(y-5)}{2x}\) for \(x = 0\) \(y = 2\)

Simplify.

4. \(m(m - 6) + 3m(m + 2)\)
5. \(-1^2 + \frac{4}{2}a - |6 - 12 ÷ 3 \cdot 4|\)
6. \(\frac{5t^{-2}}{20}\)
7. \(\frac{16^4y^2z^{-6}}{16^3y^4z^2}\)
8. Which of the following are rational numbers? \(-2, 0, \frac{5}{2}, \pi, \sqrt{2}\)
9. Write an Algebraic Expression: Five less than the sum of two numbers is 20

Solve for the indicated variable.

10. \(3xy + 2xy - 12 = 3y\) for \(y\)
11. \(\frac{a + bc}{2+b} = 10\) for \(b\)
12. \(\frac{ac + bc}{6c} = 10\) for \(b\)

Solve.

13. \(3x - 5 = 25\)
14. \(10(9 - p) = 9 - p\)
15. \(4 + x = 3(x - 4)\)

Solve and graph the inequality on a number line.

16. \(\frac{-5x}{3} \leq 5\)
17. \(7 - 3x > 11 - 2x\)
Plot and label the given points on the graph.

18. (−1, 0)
19. (0, 3)
20. (−4, 2)
21. (5, −1)

Graph on the same grid. Label each graph.

22. \( y = -3x + 2 \)
23. \( x = 4 \)
24. \( y = -2 \)
25. \( y - \frac{1}{2}x = 1 \)
Multiple Choice

26. Which quadrant is the point \((-3, 5)\) located in?
   a) I  c) III
   b) II  d) IV

27. Find the slope of the equation \(3x + 5y = 6\)
   a) 3  c) \(\frac{-3}{5}\)
   b) 5  d) \(\frac{3}{5}\)

28. Find the slope of the line containing the points \((-1,3)\) and \((2, -4)\).
   a) \(-7\)  c) \(\frac{7}{3}\)
   b) \(\frac{-7}{3}\)  d) \(\frac{3}{7}\)

29. Given the point \((-2, 7)\) and a slope of zero, find the equation of the line
   a) \(-2x + 7y = 0\)  c) \(y = 7x\)
   b) \(-x + \frac{7}{2}y = 0\)  d) None of these.

30. Find an equation containing the points \((2,7)\) and \((-1, 9)\).
   a) \(y = -\frac{2}{3}x + \frac{25}{3}\)  c) \(3y = -2x + 25\)
   b) \(y = \frac{2}{3}x + \frac{25}{3}\)  d) Both a and c

31. Fill in the blank: \(x^2 + 2x - 4\) is a __________.
   a) Monomial  d) Polynomial
   b) Binomial  e) Both c and d
   c) Trinomial

32. Given the polynomial, \(x^2yz^2 + xyz^4 + x^2y^3z + xyz\), state the degree of the polynomial.
   a) 2  c) 5
   b) 4  d) 6
33. Subtract $2x^3 + 1$ from $5x^4 + x^3 + 2x^2 + 3$
   a) $5x^4 - x^3 + 2x^2 + 2$
   b) $5x^4 + x^3 + 2x^2 + 4$
   c) $5x^4 + x^3 + 2x^2 - 2$
   d) $5x^4 + x^3 + 2x^2 - 2$

34. Multiply: $(x - 2)^2$
   a) $x^2 - 4x + 4$
   b) $x^2 - 2x - 4$
   c) $x^2 + 4$
   d) $x^2 - 4$

35. Multiply: $(x + 2)(x^2 - 3x + 4)$
   a) $x^3 - x^2 + 2x - 8$
   b) $x^3 - x^2 - 2x - 8$
   c) $x^3 - x^2 + 2x + 8$
   d) $x^3 + x^2 - 2x + 8$

Perform the indicated operations. Simplify.

36. $(12p^3 + p^2 - 6p) + (-5p^2 + 14p) - (14p^3 + 1)$
37. $9x + 3(-y - a) - 3(3x - y) + 3a$
38. $(2t)^{-4}$
39. $\frac{(-6y^2)^2}{(-2y^3)^3} \div \frac{-18}{2y^9}$

Factor completely.

40. $8x + 24 - 96y$
41. $3x(x + 1) + 2(x + 1)$
42. $3x(x + 2) + (2x + 4)$
43. $x^2 - 4x - 21$
44. Solve: $\frac{1}{2}x - 4 = \frac{1}{3}x + 8$
45. True or False: The slope of the line $y = 4$ is undefined.

Word problems.

46. Taxis in Brooklyn charge $5.00 plus $2.00 per mile for off-peak fares. How far can Ashley travel for $17.00 during off-peak hours?

47. A lawyer charges $240 plus $60 per hour for a divorce. If the total charge for Nelson’s divorce was $1440, then for what number of hours did the lawyer work on the case?

48. A rectangular sunroom has a length that is 3 feet longer than its width and a perimeter of 42 feet. Find the dimensions of the sunroom.
49. The sum of two numbers is 70. Twice a number is 5 less than three times another number. Find the numbers.

50. There are three consecutive odd integers. The sum of the numbers is 27 less than four times the smallest number. What are the three numbers?

51. Three consecutive integers are such that the sum of the smallest and the largest integers is 8 less than six times the second integer. Find the three consecutive integers.

52. A scalene triangle has three unequal sides. The perimeter of a scalene triangle is 51 meters. The second side is 3 meters more than the first side, and the third side is two times the length of the first side. Find the length of each side of the scalene triangle.

53. Speed Trucks rent their trucks for $10 per day and 25 cents per mile. Seung Lee rents a 15 feet truck for two days to deliver a refrigerator. How far can he travel within a budget of $70 for two days?

54. A scalene triangle has three unequal sides. The perimeter of a scalene triangle is 104 meters. If the first side is twice as long as the second side and the third side is 24 meters longer than the second side, what are the measures of the three sides?

55. A number is five less than three times another number. If the sum of the two numbers is 15, find the numbers.
Solutions:

1. $-18$
2. $0$
3. Undefined
4. $4m^2$
5. $2a - 11$
6. $\frac{1}{4\epsilon^2}$
7. $\frac{16}{y^2z^8}$
8. $-2, 0, and \frac{5}{2}$
9. $(x + y) - 5 = 20$
10. $y = \frac{12}{5x - 3}$
11. $b = \frac{20 - a}{c - 10}$
12. $b = 60 - a$
13. $x = 10$
14. $p = 9$
15. $x = 8$

Number line graphs.

16. $x \geq -3$

17. $x < -4$

Plotting points.

18. $(−1, 0)$ is located on the x-axis. From the origin, move left by one unit on the x-axis.
19. $(0, 3)$ is located on the y-axis. From the origin, move up 3 units.
20. $(−4, 2)$ is located in quadrant II. From the origin, move 4 units to the left and 2 units up.
21. $(5, −1)$ is located in quadrant IV. From the origin, move 5 units to the right and 1 unit down.
Graph on the same grid. Label each graph.

22.
23. \[ x = 4 \]

24. \[ y = -2 \]

25. \( (0, 1) \) and \( (-2, 0) \)
Multiple Choice
26. b
27. c
28. b
29. d
30. d
31. e
32. d
33. a
34. a
35. b

Operations and simplifying.
36. \(-2p^3 - 4p^2 + 8p - 1\)
37. 0
38. \(\frac{1}{16t^4}\)
39. \(\frac{y}{2}\)
40. \(8(x + 3 - 12y)\)
41. \((3x + 2)(x + 1)\)
42. \((3x + 2)(x + 2)\)
43. \((x + 3)(x - 7)\)
44. \(x = 72\)
45. False. The line \(y = 4\) has a slope of zero or no slope

Word problems.
46. \(x = 6\) miles
47. \(x = 20\) hrs
48. Width = 9 feet;
   Length = 12 feet
49. 41 and 29;
   \(\text{Set up: } 2x = 3(70 - x) - 5\)
50. 33, 35, 37
51. 1, 2, 3

52. First side is 12 meters; second side is 15 meters, third side is 24 meters.

53. \(\text{Set up: } 10(2) + .25x = 70; \text{ Answer: } x = 200\) miles

54. The first side is 40 meters; second side is 20 meters; third side is 44 meters.

55. \(\text{Set up: } x + (3x - 5) = 15 \text{ or } x = 3(15 - x) - 5; \text{ Answer: } 5\ and\ 10\)