Math 51 Exam Review First Half

Evaluate.

1. $-10 + [8 - (4 + (-3))]$

2. $-9.6 - (3.5 - 12.6)$

3. $\dfrac{3^2 - 4^2}{7(8-9)}$

4. $3 \cdot 4^2 + 10 \div 2$

Evaluate the following for the indicated values of the variable.

5. $y + \dfrac{8}{x}$ when $x = 2$, $y = 1$

6. $3x^2 - y^2$ when $x = -2$, $y = -5$

Simplify

7. $x -- 3y + 2x + 4y$

8. $3(4x - 2) - (x - 10)$

Solve the following equations.

9. $4x + 13 = -23$

10. $10x - 12 = 8x - 4$

11. $-\tfrac{3}{4}x = 24$

12. $\dfrac{4.5}{1.1} = \dfrac{9}{x}$

13. $5 - 2(x - 1) = 10 - 2x$

14. $7 + 4x - 12 + x = 5(3 - 2x)$

15. A map is drawn so that every 3.5 inches corresponds to an actual distance of 100 miles. If the actual distance between two cities is 420 miles, how far apart are they on the map?

16. If 100 feet of wire has an electrical resistance of 7.3 ohms, what is the electrical resistance of 40 feet of that wire?

Solve the following inequalities.

17. $2 - 3x \le 14$

18. $x + 8 < 3$

Solve for the indicated variable.

19. $C = 2\pi r$ for r

20. $7x + 2y = 10$ for y

21. One number is seven less than four times another number. If their sum is 103. Find both numbers.

22. The perimeter of a rectangle is 244 m. If the length is four more than the width, what are the dimensions of the rectangle?

23. Stan paid $580.50 after taxes for a new television. If the sales tax rate is 7.5%, what was the cost of the television before taxes?

Simplify each expression. Write all answers using only positive exponents.

24. $(-10y^6)(14y^7)$

25. $(4x^0y^2)^3$

26. $\dfrac{8x^5y}{12x^2y^2}$

27. $(4x^2y^{-4})^{-2}$

Add or subtract as indicated to simplify.

28. $(8x^3 - 6x + 12) - (3x^3 + 9x - 7)$

29. $(4y^2 - 4y + 5) + (5y^2 - 7y - 11)$

Multiply the following polynomials.

30. $7x(3x^2 - 4x + 5)$

31. $(4x + 7)(4x - 7)$

32. $(5x - 4)(3x - 2)$

33. Divide $\dfrac{3x^2 - 5x + 5}{x - 2}$

34. Two cars leave the same house at the same time traveling in opposite directions along a straight road. One car travels at a rate of 35 miles per hour, while the other travels 43 miles per hour. In how many hours will the cars be 429 miles apart?

35. A chemist needs 50 gallons of 48% iodine. She has 50% iodine and 40% iodine in the lab. How many gallons of each should be mixed together?

Factor completely.

36. $x^2 - 9x + 14$

37. $8a^3 - 24a^2 - 80a$

38. $25x^2 - 196$

39. $6x^2 - 19x - 7$

40. $4x^2 + 20x + 25$

Solve the following equations.

41. $x^2 - 29x + 100 = 0$

42. $3y^2 + 11y - 4 = 0$

43. The length of a rectangle is seven more than its width. If the area of the rectangle is 170 sq cm, what are the length and width?

44. With the wind, a plane flew 425 miles in the same time that it took to fly 375 miles against the wind. If the wind speed was 10 mph, what was the plane's speed?

45. Find the values where the expression is undefined. $\dfrac{2x + 1}{x^2 - 64}$

Perform the indicated operations and simplify.

46. $\dfrac{2x + 3}{x - 4} \cdot \dfrac{x^2 - 16}{6x + 9}$

47. $\dfrac{x^2 - 6x + 8}{x^2 + 3x - 18} \div \dfrac{x - 4}{x + 6}$

48. $\dfrac{3x - 1}{x^2 + 5x + 4} - \dfrac{x - 9}{x^2 + 5x + 4}$

49. $\dfrac{4}{x - 5} + \dfrac{3}{x + 2}$

50. $\dfrac{21}{25p^3} - \dfrac{3}{10p^2}$

Solve the following equations.

51. $\dfrac{4}{x^2} = 1 - \dfrac{3}{x}$

52. $\dfrac{9}{2x - 4} - \dfrac{3}{2} = \dfrac{x}{x - 2}$

ANSWERS

1. -3 2. -0.5 3. 1 4. 53 5. 5 6. -13 7. $3x + y$

8. $11x + 4$ 9. -9 10. 4 11. -32 12. 2.2 13. No solution 14. $\dfrac{4}{3}$

15. 14.7in 16. 2.92 ohms 17. $x \geq -4$ 18. $x < -5$ 19. $r = \dfrac{C}{2\pi}$ 20. $y = -\dfrac{7}{2}x + 5$

21. $22, 81$ 22. 59 m, 63 m 23. $540 24. $-140y^{13}$ 25. $64y^6$ 26. $\dfrac{2x^3}{3y}$

27. $\dfrac{y^8}{16x^4}$ 28. $5x^3 - 15x + 19$ 29. $9y^2 - 11y - 6$ 30. $21x^3 - 28x^2 + 35x$

31. $16x^2 - 49$ 32. $15x^2 - 22x + 8$ 33. $3x + 1 + \dfrac{7}{x-2}$ 34. 5.5 hours

35. 40 gal of 50% and 10 gal of 40% 36. $(x-7)(x-2)$ 37. $8a(a-5)(a+2)$ 38. $(5x-14)(5x+14)$

39. $(3x + 1)(2x - 7)$ 40. $(2x + 5)^2$ 41. $25, 4$ 42. $-4, \dfrac{1}{3}$ 43. 10 cm, 17 cm

44. 160 mph 45. $8, -8$ 46. $\dfrac{x+4}{3}$ 47. $\dfrac{x-2}{x-3}$ 48. $\dfrac{2}{x+1}$ 49. $\dfrac{7(x-1)}{(x+2)(x-5)}$

50. $\dfrac{42 - 15p}{50p^3}$ 51. $4, -1$ 52. 3