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Solve.

1. $2a - 17 = -45$

2. $7m - 20 - m - 45 = -4m + 55$

3. $2(3y + 11) = 5(3y + 9)$

4. $2(5x + 1) - (3x - 7) = 11$

5. $7 + 3(8A + 2) = -(2A - 5)$

6. $6(2x + 4) = 3(4x + 5)$

7. $\frac{5}{7}x + \frac{9}{14} = \frac{3x}{4} + \frac{1}{2}$

8. $\frac{3}{4}x + 2 = \frac{2}{3}x + \frac{3}{8}$

9. $\frac{5}{9}x + \frac{1}{6} = -\frac{3}{4}$

10. $\frac{2x+1}{3} = \frac{3x-5}{2}$

11. $\frac{1}{4}(5x-3) + \frac{1}{3}(7x+2) = \frac{5}{6}$

Solve and write the solution in interval notation; it's helpful to graph on a number line.

12. $-3x + 9 < 48$

13. $7 - 2x \geq 23$

14. $4(3x + 5) \leq 8(2x - 6)$

15. $-11 < 5 + x < 20$

16. $32 < 4x + 8 \leq 56$

17. $|x-7| \leq 12$

18. $|2x+5| > 17$

19. $|8-4x| + 12 \leq 20$

20. **State the intercepts** for $2x + 4y = 4$. **Graph.**

21. **State the intercepts** for $6x - 3y = 24$. **Graph.**

22. State the intercepts for $y + 3x = 6$. **Graph.**

23. State the intercepts for $2y - 4x = -12$. **Graph.**

24. **Graph**: $y = 2x + 3$

25. **Graph:** $2x + 3y = 12$

26. **Graph:** $2x - y = 6$

27. **Graph:** $y = \frac{1}{2}x - 3$

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Simplify appropriately.

28. $(9z^2 + 21z - 25) + (6z^2 - 7z - 4)$

29. $(4m^2 - 6m + 14) - (2m^2 - 5m - 11)$

30. $2(5x^2 - 7x - 2) - 4(8x^2 + 5x - 7)$

31. $(m + 7)(m + 3)$

32. $(y - 7)(2y + 3)$

33. $(5x + 8)(-x + 2)$

34. $(-2x - 5)(-3x + 7)$

35. $(4m - 6)(2m + 5)$

36. $(4x - 7)^2$

37. $(3x + 5y)^2$

38. $m^3 \cdot m^4$

39. $a^6(a^2)(a)(a^{10})$

40. $x^3y^6z^2(x^4y^7z^3)$

41. $9a^3b(-2a^5b^2)$

42. $(x^3)^5$

43. $(x^2)^8(x^3)^9$

44. $5x^6y(4x^3y^7)^2$

45. $(2x^2y^4z^5)^3(x^6y^7)^2$

46. $\dfrac{x^5}{x^3}$

47. $\dfrac{x^2y^6}{x^3y}$

48. $\dfrac{24x^{11}y^2}{30x^3y^5}$

49. $\dfrac{x^3}{x^{-6}}$

50. $\dfrac{x^{-5}}{x^2}$

51. $\dfrac{25x^{-12}y^{-7}z^{11}}{40x^6y^{-2}z^6}$

52. $\dfrac{\left(x^{-5}y^2\right)^{-4}y^3}{\left(x^3y^{-6}\right)^{-1}x^4}$

53. $\left(\dfrac{x^2}{y^{-3}}\right)^4$

54. $\left(\dfrac{a^2b}{a^{-5}b^2}\right)^{-4}$

55. $\left(\dfrac{a^3b^{-4}c^{-3}}{a^6b^2c^{-4}}\right)^{-5}$

56. **Divide:** $\dfrac{24x^3 + 30x^2 - 12x}{6x}$

57. **Long Divide:** $\dfrac{x^2 + 9x + 14}{x + 2}$

58. **Long Divide:** $\dfrac{10x^2 + 23x + 20}{5x + 4}$

59. **Long Divide:** $\dfrac{x^3 + 6x^2 + 3}{x + 2}$

Factor.

60. $x^2 + 25x$

61. $16x^3 - 24x^2$

62. $A^2 - 81$

63. $16y^2 - 25$

64. $ax + ay + bx + by$

65. $k^2 - 2k - 15$

66. $z^2 + 10z + 16$

67. $x^2 + 3x - 28$

68. $m^2 - 10m + 24$

69. $m^2 - 10m - 24$

70. $3m^2 + 21m + 18$

71. $6x^2 + 17x + 5$

72. $8x^2 + 10x - 7$

73. $5x^2 - 14x - 3$

74. $7x^2 - 16x + 4$

75. $10x^2 + 19x + 6$

76. $64x^3 + 125$

77. $x^3 - 7x^2 + 10x$

78. $10x^2 + 25x - 60$

79. $6x^5 - 22x^4 + 12x^3$

80. $x^3 + 7x^2 - 9x - 63$

Solve.

81. $d^2 - 144 = 0$

82. $9m^2 - 49 = 0$

83. $x^2 + 11x + 24 = 0$

84. $x^2 + 2x - 15 = 0$

85. $k^2 = 9k - 18$

86. $3b^2 - 5b = -2$

87. $6x^2 + 29x + 9 = 0$

88. $4y^2 = -9y + 9$

89. $9x^2 + 4 = -12x$

90. $z(z - 3) = 28$

91. $8x^2 + 3x - 7 = 2x^2 + 8x - 3$

Set up and solve.

92. Four times Friday's temperature, decreased by 12 degrees, was 56 degrees. What was Friday's temperature?

93. A leather jacket costs $105 more than twice a cloth jacket. Together they cost $342. Find the cost of each one.

94. The sum of two pieces of fence is 80 feet. The longer one is 8 feet less than 3 times the shorter one. What is the length of each piece of fence?

95. In a rectangle, the length is 12 inches more than the width. The perimeter is 96 inches. Find the length and width.

96. In a rectangle, the width is 9 inches less than twice the length. The perimeter is 72 inches. Find the length and width.

97. Use a proportion: On a map, 3 inches represents 180 miles. How many miles are represented by 5 inches?

98. A chemist had to mix some 12% ascetic acid with 50 gallons of 24% ascetic acid to get a mixture that is 20% ascetic acid. How many gallons of 12% ascetic acid was used?

99. Solutions of 30% hydrochloric acid and of 18% hydrochloric acid were mixed together to get 60 liters of 20% hydrochloric acid. How many liters of the 30% solution were used?

100. Molly invested some money at 4% and $4000 more than this at 6%. Her annual interest was $580. How much was invested at each rate?

101. Joseph invested some of an inheritance at 5% and $300 more than twice this at 7%. If his annual interest from these investments was $401, how much did Joseph invest at each rate?

102. A club sold blue shirts for $15 each and red shirts for $18 each. If the club sold 200 shirts and brought in $3351, how many of each type shirt were sold?

103. Children's tickets to a play cost $5 each while adult tickets cost $9. The theater sold 80 tickets and brought in $492. How many children's tickets and how many adult tickets were sold?

104. The length of a rectangle is 3 feet more than the width. The area is 40 square feet. Find the length and width.

105. A 13 foot ladder is leaning against a house. The ladder reaches a height on the wall that is 12 feet above the ground. Find how far the bottom of the ladder is from the house.