49. $5 + 2q = 3q$

50. $-4 - 5p = -4p$

51. $8x - 1 = 9 + 9x$

52. $4x - 2 = -8 + 5x$

53. $-3x + 1 = -1 - 2x$

54. $-6x + 3 = -7 - 5x$

‹4› Identities, Conditional Equations, and Inconsistent Equations

Solve each equation. Identify each as a conditional equation, an inconsistent equation, or an identity.

See Examples 5 and 6.

See Recognizing Identities and Inconsistent Equations on page 107.

55. $x + x = 2x$

VIDEO **56.** $2x - x = x$

57. $a - 1 = a + 1$

58. $r + 7 = r$

59. $3y + 4y = 12y$

VIDEO **60.** $9t - 8t = 7$

61. $-4 + 3(w - 1) = w + 2(w - 2) - 1$

62. $4 - 5(w + 2) = 2(w - 1) - 7w - 4$

VIDEO **63.** $3(m + 1) = 3(m + 3)$

64. $5(m - 1) - 6(m + 3) = 4 - m$

65. $x + x = 2$

66. $3x - 5 = 0$

67. $2 - 3(5 - x) = 3x$

68. $3 - 3(5 - x) = 0$

69. $(3 - 3)(5 - z) = 0$

70. $(2 \cdot 4 - 8)p = 0$

71. $\frac{0}{x} = 0$

72. $\frac{2x}{2} = x$

73. $x \cdot x = x^2$

74. $\frac{2x}{2x} = 1$

Miscellaneous

Solve each equation.

75. $3x - 5 = 2x - 9$

76. $5x - 9 = x - 4$

77. $x + 2(x + 4) = 3(x + 3) - 1$

78. $u + 3(u - 4) = 4(u - 5)$

79. $23 - 5(3 - n) = -4(n - 2) + 9n$

80. $-3 - 4(t - 5) = -2(t + 3) + 11$

81. $0.05x + 30 = 0.4x - 5$

82. $x - 0.08x = 460$

83. $-\frac{2}{3}a + 1 = 2$

84. $-\frac{3}{4}t = \frac{1}{2}$

85. $\frac{y}{2} + \frac{y}{6} = 20$

86. $\frac{3w}{5} - 1 = \frac{w}{2} + 1$

87. $0.09x - 0.2(x + 4) = -1.46$

88. $0.08x + 0.5(x + 100) = 73.2$

89. $436x - 789 = -571$

90. $0.08x + 4533 = 10x + 69$

91. $\frac{x}{344} + 235 = 292$

92. $34(x - 98) = \frac{x}{2} + 475$

‹5› Applications

Solve each problem. See Example 7.

93. ***Sales commission.*** Danielle sold her house through an agent who charged 8% of the selling price. After the commission was paid, Danielle received \$117,760. If x is the selling price, then x satisfies

$$x - 0.08x = 117{,}760.$$

Solve this equation to find the selling price.

94. ***Raising rabbits.*** Before Roland sold two female rabbits, half of his rabbits were female. After the sale, only one-third of his rabbits were female. If x represents his original number of rabbits, then

$$\frac{1}{2}x - 2 = \frac{1}{3}(x - 2).$$

Solve this equation to find the number of rabbits that he had before the sale.

95. ***Eavesdropping.*** Reginald overheard his boss complaining that his federal income tax for 2006 was \$60,531.

a) Use the accompanying graph to estimate his boss's taxable income for 2006.

b) Find his boss's exact taxable income for 2006 by solving the equation

$$42{,}170 + 0.33(x - 188{,}450) = 60{,}531.$$

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Exercises 3.1

‹ Study Tips ›

- It is a good idea to work with others, but don't be misled. Working a problem with help is not the same as working a problem on your own.
- Math is personal. Make sure that you can do it.

Reading and Writing *After reading this section, write out the answers to these questions. Use complete sentences.*

1. What is an ordered pair?

2. What is the rectangular coordinate system?

3. What name is given to the point of intersection of the x-axis and the y-axis?

4. What is the graph of an equation?

5. What is a linear equation in two variables?

6. What are intercepts?

‹1› Ordered Pairs

Complete each ordered pair so that it satisfies the given equation. See Example 1.

7. $y = 3x + 9$: $(0, \quad), (\quad, 24), (2, \quad)$

VIDEO 8. $y = 2x + 5$: $(8, \quad), (-1, \quad), (\quad, -1)$

9. $y = -3x - 7$: $(0, \quad), \left(\frac{1}{3}, \quad\right), (\quad, -5)$

10. $y = -5x - 3$: $(-1, \quad), \left(-\frac{1}{2}, \quad\right), (\quad, -2)$

11. $y = 1.2x + 54.3$: $(0, \quad), (10, \quad), (\quad, 54.9)$

12. $y = 1.8x + 22.6$: $(1, \quad), (-10, \quad), (\quad, 22.6)$

13. $2x - 3y = 6$: $(3, \quad), (\quad, -2), (12, \quad)$

14. $3x + 5y = 0$: $(-5, \quad), (\quad, -3), (10, \quad)$

15. $0 \cdot y + x = 5$: $(\quad, -3), (\quad, 5), (\quad, 0)$

16. $0 \cdot x + y = -6$: $(3, \quad), (-1, \quad), (4, \quad)$

Use the given equations to find the missing coordinates in the following tables.

17. $y = -2x + 5$

x	y
-2	
0	
2	
	-3
	-7

18. $y = -x + 4$

x	y
-2	
0	
2	
	0
	-2

19. $y = \frac{1}{3}x + 2$

x	y
-6	
-3	
	2
	3

20. $y = -\frac{1}{2}x + 1$

x	y
-2	
-1	
	1
	$\frac{1}{2}$

21. $y - 20x = 400$

x	y
-30	
	0
-10	
0	
	600

22. $200x + y = 50$

x	y
$-\frac{1}{2}$	
	100
0	
	0
$\frac{1}{2}$	