Section 2.7 Properties of Real Numbers and Simplifying Expressions

Section 2.7 Practice Exercises

1. (**a**) constant

(**b**) coefficient

(**c**) 1; 1

(**d**) like

3. $(-2) + 9 = 7$

5. $-1 - (-19) = -1 + 19 = 18$

7. $-27 \div 5 = -\dfrac{27}{5} = -5.4$

9. $0(-15) = 0$

11. $\dfrac{25}{21} - \dfrac{6}{7} = \dfrac{25}{21} - \dfrac{18}{21} = \dfrac{7}{21} = \dfrac{1}{3}$

13. $\left(-\dfrac{11}{12}\right) \div \left(-\dfrac{5}{4}\right) = \left(-\dfrac{11}{12}\right) \cdot \left(-\dfrac{4}{5}\right)$

$= \dfrac{44}{60} = \dfrac{11}{15}$

15. $-8 + 5$

17. $x + 8$

19. $4(5)$

21. $-12x$

23. $x + (-3)$; $-3 + x$

25. $4p + (-9)$; $-9 + 4p$

27. $(x+4)+9 = x+(4+9) = x+13$

29. $-5(3x) = (-5 \cdot 3)x = -15x$

31. $\dfrac{6}{11}\left(\dfrac{11}{6}x\right) = \left(\dfrac{6}{11} \cdot \dfrac{11}{6}\right)x = x$

33. $-4\left(-\dfrac{1}{4}t\right) = \left(-4 \cdot -\dfrac{1}{4}\right)t = t$

35. $-8 + (2 + y) = (-8 + 2) + y$

$= -6 + y$

37. $-5(2x) = (-5 \cdot 2)x = -10x$

39. Reciprocal

41. Zero

43. $6(5x + 1) = 6(5x) + 6(1) = 30x + 6$

45. $-2(a + 8) = -2a + (-2)(8) = -2a - 16$

47. $3(5c - d) = 3(5c) - 3d = 15c - 3d$

49. $-7(y - 2) = -7y - (-7)(2) = -7y + 14$

51. $-\dfrac{2}{3}(x-6) = -\dfrac{2}{3}x - \left(-\dfrac{2}{3}\right)(6)$

$= -\dfrac{2}{3}x + \dfrac{12}{3} = -\dfrac{2}{3}x + 4$

53. $\dfrac{1}{3}(m-3) = \dfrac{1}{3}m - \dfrac{1}{3} \cdot 3 = \dfrac{1}{3}m - 1$

55. $-(2p + 10) = -2p - 10$

57. $-2(-3w - 5z + 8)$

$= -2(-3w) - 2(-5z) - 2(8)$

$= 6w + 10z - 16$

59. $4(x + 2y - z) = 4(x) + 4(2y) - 4(z)$

$= 4x + 8y - 4z$

61. $-(-6w + x - 3y) = 6w - x + 3y$

63. $2(3 + x) = 6 + 2x$

65. $4(6z) = 24z$

67. $-2(7x) = -14x$

69. $-4(1 + x) = -4 - 4x$

71. b

73. i

75. g

77. d

79. h

81. Term: $2x$, coefficient 2;
Term: $-y$, coefficient -1;
Term: $18xy$, coefficient 18;
Term: 5, coefficient 5.

83. Term: $-x$, coefficient -1;
Term: $8y$, coefficient 8;
Term: $-9x^2y$, coefficient -9;
Term: -3, coefficient -3.

85. The variable factors are different.

87. The variables are the same *and* raised to the same power.

89. Answers vary: $5y$, $-2x$, 6

91. $-4p-2p=-6p$

93. $2y^2-5y^2-3y^2=-6y^2$

95. $8x^3y+3-7-x^3y=7x^3y-4$

97. $\frac{2}{5}+2t-\frac{3}{5}+t-\frac{6}{5}=3t-\frac{7}{5}$

99. $-3(2x-4)+10=-6x+12+10$
$=-6x+22$

101. $4(w+3)-12=4w+12-12=4w$

103. $5-3(x-4)=5-3x+12=-3x+1$

105. $-3(2t+4w)+8(2t-4w)$
$=-6t-12w+16t+32w$
$=10t-44w$

107. $2(q-5u)-(2q+8u)$
$=2q-10u-2q-8u=-18u$

109. $-\frac{1}{3}(6t+9)+10=-2t-3+10$
$=-2t+7$

111. $10(5.1a-3.1)+4=51a-31+4$
$=51a-27$

113. $-4m+2(m-3)+2m$
$=-4m+2m-6+2m=-6$

115. $\frac{1}{2}(10q-2)+\frac{1}{3}(2-3q)=5q-1+\frac{2}{3}-q$
$=5q-q-1+\frac{2}{3}$
$=4q-\frac{1}{3}$

117. $7n-2(n-3)-6+n$
$=7n-2n+6-6+n=6n$

119. $6(x+3)-12-4(x-3)$
$=6x+18-12-4x+12=2x+18$

121. $0.2(6c-1.6)+c$
$=1.2c-0.32+c=2.2c-0.32$

123. $6+2[-8-3(2x+4)]+10x$
$=6+2[-8-6x-12]+10x$
$=6+2[-6x-20]+10x$
$=6-12x-40+10x=-2x-34$

125. $1-3[2(z+1)-5(z-2)]$
$=1-3[2z+2-5z+10]$
$=1-3[-3z+12]$
$=1+9z-36$
$=9z-35$

127. Equivalent

129. Not equivalent. The terms are not *like* terms and cannot be combined.

131. Not equivalent. Subtraction is not commutative.

133. Equivalent

135. (a) $10+(1+9)+(2+8)+(3+7)+(4+6)+5=55$

(b) $(1+19)+(2+18)+(3+17)+(4+16)+(5+15)+(6+14)+(7+13)+(8+12)+(9+11)+10+20=210$