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8th Ch1: Principles of Algebra

1-1: Variables and Expressions

EX1) Evaluate each expression for the given value of the variable.

a) $x - 5$ for $x = 12$

b) $2y + 1$ for $y = 4$

c) $6(n + 2) - 4$ for $n = 5, 6, 7$

EX2) Evaluate each expression for the given values of the variables.

a) $4x + 3y$ for $x = 2$ and $y = 1$

b) $9r - 2p$ for $r = 3$ and $p = 5$

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EX3) Use the expression $1.8c + 32$ to convert each boiling point temperature from degrees Celsius to degrees Fahrenheit.

a) Boiling point of water at sea level: 100°C

b) Boiling point of water at an altitude of 4400 *meters*: 85°C

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1-2: Algebraic Expressions

EX1) Write an algebraic expression for each word phrase.

a) 9 less than a number w

b) 3 increased by the difference p and 5

EX2) Write a word phrase for the algebraic expression $9 - 3c$.

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EX3) A restaurant leased its banquet hall for a function. The cost was \$10 per person. Write an algebraic expression to evaluate what the cost would be if 20, 21, 22, *or* 23 people attended the function.

EX4) Write a word problem that can be evaluated by the algebraic expression $27 + t$, and evaluate the expression for $t = 1.76$.

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1-3: Integers and Absolute Value

EX1)

a) Use $<$, $>$, *or* $=$ to compare the scores. Aaron's score is 4, and Felicity's score is -1 .

b) List the golfers' scores in order from the lowest to the highest. The scores are -4 , 2 , 5 , *and* -3 .

EX2) Write the integers 8 , -5 , *and* 4 in order from least to greatest.

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EX3) Find the additive inverses of each integer.

a) 6

b) -14

c) 0.5

EX4) Evaluate each expression.

a) $|-8| + |-5|$

b) $|5 - 6|$

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1-4: Adding Integers

EX1) Use a number line to find the sum.

a) $(-6) + 2$

b) $-3 + (-6)$

EX2) Add.

a) $1 + (-2)$

b) $(-8) + 5$

c) $(-2) + (-4)$

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EX3) Evaluate $c + 4$ for $c = -8$

EX4) Meka opened a new bank account. Find her account balance after the first four transactions, listed below.

Deposit: \$200, \$20

Withdrawals: \$166, \$38

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1-5: Subtracting Integers

EX1) Subtract.

a) $-7 - 4$

b) $8 - (-5)$

c) $-6 - (-3)$

EX2) Evaluate each expression for the given value of the variable.

a) $8 - j$ for $j = -6$

b) $-9 - y$ for $y = -4$

c) $n - 6$ for $n = -2$

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EX3) The top of the Sears Tower, in Chicago, is 1454 *feet* above street level, while the lowest level is 43 *feet* below street level. How far is it from the lowest level to the top?

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1-6: Multiplying and Dividing Integers

EX1) Multiply or divide.

a) $-6(4)$

b) $-8(-5)$

c) $\frac{-18}{2}$

d) $\frac{-25}{-5}$

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EX2) Simplify.

a) $3(-6 - 12)$

b) $-5(-5 + 2)$

c) $-2(14 - 5)$

EX3) A golfer plays 5 holes. On 3 holes, he has a gain of 4 strokes each. On 2 holes, he has a loss of 4 strokes each. Each gain in strokes can be represented by a positive integer, and each loss can be represented by a negative integer. Find the total net change in strokes.

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1-7: Solving Equations by Adding or Subtracting

EX1) Determine which value of x is a solution of the equation.

$$x + 8 = 15; x = 5, 7, \text{ or } 23$$

EX2) Solve.

a) $10 + n = 18$

b) $p - 8 = 9$

c) $22 = y - 11$

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1-8: Solving Equations by Multiplying or Dividing

EX1) Solve

a) $6x = 48$

b) $-9y = 45$

EX2) Solve.

$$\frac{b}{-4} = 5$$

EX3) To go on a school trip, Helene has raised \$670, which is only *one – fourth* of what she needs. What is the total amount needed?

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EX4) Solve.

$$3x + 2 = 14$$

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1-9: Introduction to Inequalities

EX1) Compare. Write $<$ or $>$.

a) $23 - 14$ 6

b) $5(12)$ 70

EX2) Solve and graph each inequality.

a) $x + 2.5 \leq 8$

b) $w - 1 < 8$