Pre-Algebra & Pre-Algebra Enriched

Unit 1

Introductory Topics
& Operations with Integers

Name _____

Period ____

Objective:

Vocabulary:

	Definition	Examples
Variable	A _____ used to represent a _____	
Numerical Expression	Contains only _____ and _____	
Variable Expression	May contain _____, _____, and one or more _____	

Example 1: Identify each expression as a numerical expression or a variable expression. For a variable expression, name the variable.

a) $5 - 5$ b) $c - 5$ c) $8 \div x + 9$ d) $100 \cdot 6$

Example 2: List possible clue words that would tell you to complete each of the following:

Addition	Subtraction	Multiplication	Division	Parentheses

Example 3: Select the BEST way to write each expression.

a)   The product of a and 5
- ☐ $a \times 5$
- ☐ $a5$
- ☐ $5 \times a$
- ☐ $5a$

b)   The quotient of 3 and x
- ☐ $3 \div x$
- ☐ $\dfrac{3}{x}$
- ☐ $x \div 3$
- ☐ $\dfrac{x}{3}$

1

Example 4: Complete the table below.

Word Phrase	Variable Expression
Nine *more than* a number y	$y + 9$
4 *less than* a number n	
A number z *times* three	
A number a *divided by* 12	
5 *times the quantity* 4 *plus* a number c	

Example 5: Write a variable expression for each word phrase.
a) 16 more than m _____

b) the product of c and 3   _____

c) b times 8   _____

d) x less than 2   _____

e) 4 more than the quotient of g and 6   _____

f) 10 less than the quotient of a number c and 13   _____

g) 9 less than 18 times a number x _____

h) 6 times the sum of a number q and 9   _____

i) one fifth of the sum of 10 and a number q _____

j) 12 times the quotient of a number g and 43   _____

k) 6 less than the product of t and 7   _____

Example 6: Write a variable expression to represent the situation.

a) number of hours in m minutes   _____

b) cost of p pens priced at $0.29 each   _____

2

Name _____

     Period _____

Express each phrase as an algebraic expression.

(1)   6 less than a number k multiplied by 25

(2)   12 times the sum of a number v and 41

(3)   4 more than the difference of 12 and a number j

(4)   7 less than the product of 30 and a number r

(5)   half the quotient of 4 and a number y

(6)   8 plus 43 less than a number w

(7)   3 less than the difference of 15 and a number u

(8)   the difference of 36 and a number h

(9)   sum of 23 and a number x

(10) 4 more than the quotient of 24 and a number m

(11) 5 plus the product of 39 and a number e

(12) 8 times the sum of a number z and 3

(13) 7 plus a number d less than 37

(14) 11 times the sum of a number z and 3

(15) 3 less than the product of a number g and 49

(16) 11 times the product of 19 and a number g

(17) a fifth of the sum of number a and 34

(18) 9 more than the quotient of 14 and a number n

3

<u>**Algebraic Expressions Self-Assessment**</u>

Name _____

Period _____

Express each phrase as an algebraic expression.

(1) _____ _____

(2) _____ _____

(3) _____ _____

(4) _____ _____

(5) _____ _____

(6) _____ _____

(7) _____ _____

(8) _____ _____

(9) _____ _____

(10) _____ _____

(11) _____ _____

(12) _____ _____

(13) _____ _____

(14) _____ _____

(15) _____ _____

(16) _____ _____

(17) _____ _____

(18) _____ _____

(19) _____ _____

(20) _____ _____

(21) _____ _____

(22) _____ _____

(23) _____ _____

(24) _____ _____

(25) _____ _____

Keep track of the problems answered incorrectly when we discuss the correct responses. Place an "X" on the line when you respond incorrectly.

My Score:

_____ / 25

4

Algebraic Expressions Worksheet 2   Name _____

                                          Period _____

Express each phrase as an algebraic expression.

(1)   8 less than 25 multiplied by a number q

(2)   7 more than the quotient of 26 and a number d

(3)   3 more than the difference of 20 and a number m

(4)   A number x plus 45

(5)   A fifth of the product of a number x and 8

(6)   9 more than a number w

(7)   4 times the sum of 41 and a number h

(8)   5 less than the quotient of a number u and 15

(9)   7 less than the difference of 22 and a number e

(10) 5 times the sum of a number u and 15

(11) 3 plus the product of 35 and y

(12) 3 plus 27 less than a number q

(13) 7 times the product of a number c and 7

(14) 6 more than the quotient of a number d and 12

(15) 8 plus a number y increased by 38

(16) 4 more the quotient of a number d and 12

(17) Add a number j to 33

(18) 11 less than the difference of 19 and a number k

(19) 8 times the product of 28 and a number g

(20) 11 less than 43 times a number r

5

(21) Difference of a number n and 17

(22) 3 plus the product of 37 and a number p

(23) 11 less than the sum of a number v and 23

(24) Half the product of a number t and 48

(25) 11 more than the difference of a number f and 18

(26) 2 more than the quotient of a number b and 6

(27) a fourth of the difference of 10 and a number a

(28) 4 less than the sum of 29 and a number u

(29) 10 plus 5 times the number x

(30) 3 times the quotient of 39 and a number n

(31) 10 less than a number j multiplied by 44

(32) 2 plus 40 more than a number x

(33) 13 times a number p

(34) 11 less than the product of 47 and a number e

(35) 4 times the sum of a number f and 46

(36) The product of 4 and a number g

Algebraic Expressions Worksheet 3
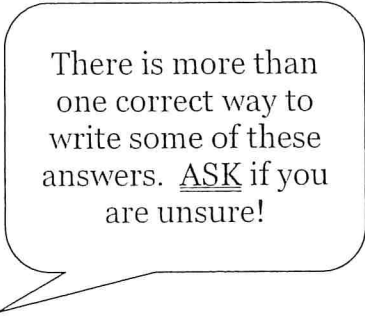
Name _____

Period _____

Express each phrase as an algebraic expression.

(1) 5 less than the difference of a number f and 35

(2) 6 less than the quotient of 2 and a number f

(3) The quotient of a number p and 38

(4) 4 more than the difference of a number x and 10

(5) 9 plus the product of 47 and a number c

(6) The product of 44 and a number y

(7) 40 divided by a number c

(8) 10 plus 21 increased by a number k

(9) 11 times the product of 31 and a number p

(10) 3 more than the sum of 32 and a number d

(11) 11 less than 5 times a number g

(12) 5 less than the quotient of a number e and 33

(13) 10 plus the product of 48 and a number x

(14) Subtract a number m from 45

(15) 9 less than the sum of a number u and 20

(16) One-third of the product of 13 and a number n

(17) 10 more than the difference of a number h and 27

(18) 7 times the difference of 17 and a number b

7

(1) $(f - 35) - 5$

(2) $\frac{2}{f} - 6$

(3) $\frac{p}{38}$

(4) $(x - 10) + 4$

(5) $9 + 47c$

(6) $44y$

(7) $\frac{40}{c}$

(8) $10 + (21 + k)$

(9) $11(31p)$

(10) $(32 + d) + 3$

(11) $5g - 11$

(12) $\frac{e}{33} - 5$

(13) $10 + 48x$

(14) $45 - m$

(15) $(u + 20) - 9$

(16) $\frac{1}{3}(13n)$

(17) $(h - 27) + 10$

(18) $7(17 - b)$

> There is more than one correct way to write some of these answers. ASK if you are unsure!

Objective:

Key Ideas

Order of Operations

An agreed upon set of rules so there is only _____ answer to a given problem.

1.

2.

3.

4.

Example 1: Show and name the different types of grouping symbols.

Example 2: What is the difference between 6^2 and $6 \cdot 2$?

Example 3: Simplify using the order of operations.

a) $4 + 8 \div 2 + 6 \cdot 3$

b) $6 \cdot (3 + 2) \div 15$

c) $14 + 16 \cdot 2^3 - 8 \div 2^2$

d) $14 \div \left[3(8 - 2) - 11 \right]$

9

e) $2\left[(12-3)\div3\cdot2\right]-7$

f) $2+\left(\dfrac{6+30}{9-3}\right)$

g) $3+4\left[13-2(6-3)\right]$

h) $5\left(3^2+2\right)-2\left(6^2-5^2\right)$

Example 4: Some urban planners specialize in planning entire new towns. These towns are designed for livability, with plenty of open space. The sketch below shows the dimensions for a new town called Panorama. Find Panorama's area.

3 km

4 km

2 km

6 km

10
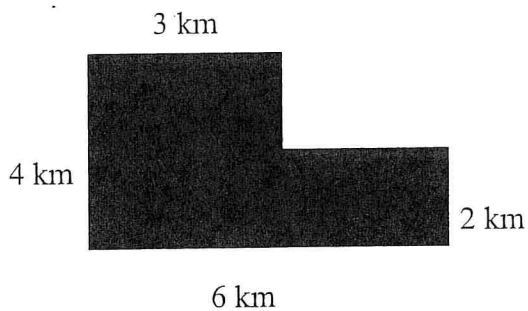
Name _____

Period _____

Simplify the expression.

(1) $9^2 + 3 \cdot 5$

(2) $4^3 - 30 \div 2$

(3) $9 + 45 \div 9 \cdot 8$

(4) $7^2 - 14 + 5 \cdot 2$

(5) $2^2 + 6(3 + 10)$

(6) $8^2 \div (8 - 4)$

(7) $14 + (3^3 - 7)$

(8) $20 \div \left(4 - (10 - 8)\right)$

(9) $\dfrac{18 + 10}{7 - 3}$

(10) $8 - 3(2 - (3 + 1)^2 \div 8 \cdot 2)$

(11) $3^2 + 5(2 + 9)$

(12) $7^2 - 8 \cdot 3 + 6$

(13) $3 \cdot 5 - (3^2 + 2) + 72 \div 8$

(14) $8 - 3 - (24 - 4^2) \div 2$

(15) $11 + 3(19 + 2)$

(16) $6(5 + 3) \div 4(6 - 3)$

(17) $10 + 2 \cdot [18 \div (5 + 1)]$

(18) $(6 - 2) \cdot 0 + 8$

ll

Name _____

Period _____

Simplify the expression.

(1) $15 \div (12 \div 2 - 1)$

(2) $(8 + 4) \div (24 \div 8)$

(3) $(16 - 8) \cdot 4 \div 16$

(4) $(5 + 9) \div 7 + 5$

(5) $(2 + 10) \div (6 - 4)$

(6) $[21 \div (10 - 3) \div 3]$

(7) $(7 \cdot 4 + 4) \div 4$

(8) $[(19 - 4) \cdot 2] \div 6$

(9) $(24 \div 4 + 6) \div 3$

(10) $[(27 - 6) \div 3] \cdot 7$

(11) $[(12 + 3) \div 5] \cdot 9$

(12) $[(67 - 4) \div 9] \cdot 6$

(13) $(20 - 4 \cdot 3) \div 2 + 7$

(14) $4 \cdot (45 \div 5) + 6 - 17$

12

(15) $64 \div (7 + 9 - 8) \cdot 3$

(16) $7 \cdot (5 + 3) \div (9 - 5)$

(17) $8 + 7 \cdot (27 \div 3 - 4)$

(18) $(28 \div 2 - 6) \cdot (5 + 2)$

(19) $(7 + 8 - 3 \cdot 3) \div 2$

(20) $12 - 3 \cdot [14 \div (3 + 4)]$

(21) $[(21 - 4) \cdot 3] - 7 \cdot 5$

(22) $60 \div [(9 - 6) \cdot 5] + 7$

(23) $42 - \{8 \cdot [(7 + 8) \div 5]\}$

(24) $\{[(18 - 9) \cdot 4] + 7\} \cdot 0$

(25) $7 + 2^4 \div 4 + 2(3^2 \cdot 2 \div 6 + 12 \div 4)$

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14

Unit 1: Introductory Lesson 3 – Writing and Evaluating Expressions

Objective:

- When substituting, ALWAYS use _____!

Example 1: Evaluate each expression when $a = 3$ and $b = 5$.

a) $7a - ab + b$

b) $10a \div (2b)$

c) $4ab - 6b + 5a$

Example 2: Evaluate each expression when $a = 2$ and $b = 6$.

a) $3b \div (2a - 1) + b$

b) $9b + a^4 \div 8$

c) $(a^3 + b^2) \div a$

d) $\dfrac{3(b-2)}{4(a+1)}$

Example 3: Evaluate the expression when $a = 6$, $b = 10$, and $c = 2$.

$a(b \div 2 - 2c) - a$

15

Example 4: Evaluate the expression when $a = 9$ and $b = 3$.

a) $\left(2a - 3b\right) \div 4$

c) $\dfrac{2a^2}{b^3} + b\left(2a + 6\right)$

d) $8\left(4b - a\right) - \left(a^2 - b^4\right)$

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Evaluating Expressions Worksheet

Name _____

Period _____

Evaluate the expression using the values given.

(1) $a^2 - b$ when $a = 8$ and $b = 7$

(2) $3(x - y)$ when $x = 4$ and $y = 1$

(3) $a + ab$ when $a = 5$ and $b = 2$

(4) $x + y^3$ when $x = 2$ and $y = 3$

(5) $10 - a + b \div 2$ when $a = 3$ and $b = 14$

(6) $12 - (x^2 + y^2)$ when $x = 1$ and $y = 2$

(7) $a(b - 1)^2$ when $a = 8$ and $b = 4$

(8) $\frac{a}{2} - 3b + 5$ when $a = 24$ and $b = 2$

(9) $3(x^2 - 4y + x)$ when $x = 6$ and $y = 7$

(10) $\frac{a+b}{b-a} + 2a$ when $a = 6$ and $b = 8$

17

(11) $ab^2 - b$ when $a = 2$ and $b = 4$

(12) $\dfrac{(xy)^2}{xy^2}$ when $x = 3$ and $y = 4$

(13) $3(8a - 5b) - 2(a + b)$ when $a = 3$ and $b = 2$

(14) $6x^3 - \dfrac{5x^2}{2}$ when $x = 2$

(15) $xyz + x^2 - y^2$ when $x = 3$ and $y = 4$ and $z = 5$

18

Name_____
Period _____

Simplify each expression.

(1) $3^2 + 5 - 10$

(2) $(6 + 9) \div 5 - 2$

(3) $4 + 7^2 - 9$

(4) $10 \div 2 \cdot 6 \div 3$

(5) $2(7 - 5) + 3 \cdot 4$

(6) $5 \cdot 7 - 4 \div 2$

(7) $17 + 12 - 10 + 4$

(8) $4 - 3^2 \div 9$

(9) $5(3 + 2) \div 5$

(10) $23 - 3(11 - 7)$

(11) $(4^2 - 6) \cdot 8 - 5$

(12) $5^2 - 3^2 + 4^2$

(13) $8(9 - 6) \div 4$

(14) $(4^3 - 7^2) \div 15$

(15) $18(9 - 3^2) + 11$

(16) $(9 - 4) \div (6 - 5)$

(17) $5(19 - 11) - 4(7 - 2)$

(18) $12 \div 3(7 - 5)$

19

(19) $\dfrac{18+10}{9-5}$

(20) $\dfrac{49-9}{7-3}$

(21) $\dfrac{37+8}{5+4}$

(22) $\dfrac{8 \cdot 4}{9+7}$

(23) $\dfrac{5(4+3)}{12-7}$

(24) $\dfrac{64 \div 8}{7+1}$

Evaluate each expression when $a = 3$, $b = 7$, and $c = 5$.

(25) $8a - b$

(26) $b^2 - a^3 - 4c$

(27) $(a \cdot b + 4) \div 5$

(28) $b^2 - c \div 5$

(29) $4(7 + ac) \div 4$

(30) $a^2 - b + c$

(31) $(c^2 + a^3) \div 2$

(32) $105 \div 3c - b$

(33) $c^2 + b - b \cdot 2$

(34) $\dfrac{7 + 3a}{c - 1}$

(35) $\dfrac{c^2-5}{3a-5}$

(36) $\dfrac{a+b+c}{ac}$

(37) $10 + 3c - c^2$

(38) $c^2 - 3b + 4a$

Write an expression to represent the situation. Do NOT solve!

(39) Seven of the algebra classes at a school have 23 students each. The eighth class has 25 students. What is the total number of students?
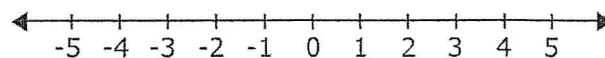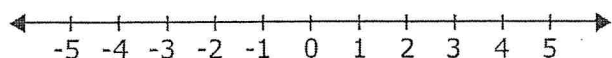
(40) During a paper drive, four teams each collected 5 tons of paper the first week. Altogether, the teams collected 2 tons each week for the next six weeks. How many tons of paper did each team collect if they each collected equal amounts?

21

22

Objective:

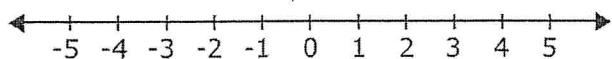**Example 1:** Use the number line to find the sum.

a) $2 + (-2)$ b) $-3 + (-2)$

c) $-5 + 7$

Key Ideas

- **Adding Integers with the Same Sign**
  Add the _____ _____ of the integers.
  Use the common sign.

      Examples:

- **Adding Integers with Different Signs**
  Subtract the _____ absolute value from the
  _____ absolute value. Use the sign of the integer with
  the _____ absolute value.

      Examples:

- **Additive Inverse Property**
  The sum of a number and its opposite (_____
  _____) is _____.

      Examples:

Example 2: Simplify.

a) $12 + (-5)$ b) $-11 + 6$ c) $-15 + (-4)$

23

Example 3: Two integers have different signs. Their sum is –5. What are three sets of possible values for the two integers?

Option 1:   Option 2:   Option 3:

When you have <u>more than two integers</u>, you can follow these steps:

1. _____ the positive integers.
2. _____ the negative integers.
3. Follow the process for adding integers with _____ _____.

Example 4: Simplify.

a) 2 + (–7) + (–3)   b) –5 + (–2) + (–4) + (–7)   c) –1 + 9 + (–6)

Example 5: At 2:00 p.m., the water pressure on a submarine is 325 pounds per square inch. From 2:00 p.m. to 2:30 p.m., the water pressure increases 83 pounds per square inch. From 2:30 p.m. to 3:00 p.m., the water pressure decreases 37 pounds per square inch. What is the water pressure at 3:00 p.m.?

Example 6: Simplify.

a) –12 + (–6) + 15 + (–3) + 10 + (–12)   b) 5 + (–1) + 2 + (–10) + 12 + (–25)

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Adding Integers Worksheet 1

1. $6 + (-4) =$

2. $-2 + 5 =$

3. $4 + 9 =$

4. $-8 + (-6) =$

5. $-9 + 8 =$

6. $7 + 4 =$

7. $0 + (-2) =$

8. $-3 + 1 =$

9. $5 + (-5) =$

10. $-4 + 8 =$

11. $9 + 2 =$

12. $6 + 5 =$

13. $-8 + (-9) =$

14. $-7 + 3 =$

15. $2 + (-7) =$

16. $-4 + 6 =$

17. $1 + 9 =$

18. $-1 + (-2) =$

19. $10 + (-4) =$

20. $8 + (-7) =$

21. $-3 + (-4) =$

22. $5 + 1 =$

23. $-6 + 2 =$

24. $8 + (-3) =$

25. $-5 + (-1) =$

26. $-9 + 5 =$

27. $2 + 7 =$

28. $3 + (-7) =$

29. $-7 + (-3) =$

30. $2 + 8 =$

31. $-8 + (-5) =$

32. $4 + (-2) =$

33. $-9 + 3 =$

34. $7 + 5 =$

35. $-13 + 2 =$

36. $4 + (-3) =$

37. $-14 + 6 =$

38. $-3 + (-4) =$

39. $-3 + (-12) =$

40. $-8 + 7 =$

41. $2 + (-2) =$

42. $-5 + 7 =$

43. $-2 + (-4) =$

44. $4 + (-3) =$

45. $5 + 9 =$

46. $-4 + 0 =$

47. $2 + (-6) =$

48. $-8 + 5 =$

49. $9 + 7 =$

50. $0 + (-2) =$

51. $-4 + 8 =$

52. $-6 + (-9) =$

53. $-7 + 1 =$

54. $2 + 4 =$

55. $-3 + (-6) =$

56. $7 + 3 =$

57. $-8 + (-5) =$

58. $-5 + (-6) =$

59. $-14 + (-9) =$

60. $12 + (-11) =$

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Adding Integers Worksheet 2

Name _____

Period _____

1. $6 + (-4) + (-3) =$

2. $-2 + 5 + 5 =$

3. $4 + 9 + (-6) =$

4. $-8 + (-6) + 8 =$

5. $-9 + 8 + (-5) =$

6. $7 + 4 + (-9) =$

7. $0 + (-2) + 2 =$

8. $-3 + 1 + 3 =$

9. $5 + (-5) + (-7) =$

10. $-4 + 8 + 2 =$

11. $9 + 2 + (-8) =$

12. $6 + 5 + 4 =$

13. $-8 + (-9) + (-9) =$

14. $-7 + 3 + 7 =$

15. $2 + (-7) + (-13) =$

16. $-4 + 6 + 4 =$

17. $1 + 9 + (-14) =$

18. $-1 + (-2) + (-3) =$

19. $10 + (-4) + (-3) =$

20. $8 + (-7) + (-8) =$

21. $10 + (-3) + (-9) =$

22. $-5 + (-4) + 6 =$

23. $3 + 11 + (-8) =$

24. $9 + 2 + (-7) =$

25. $(-1) + (-5) + 11 =$

26. $-8 + 1 + 7 =$

27. $1 + 0 + (-10) =$

28. $7 + (-10) + (-8) =$

29. $-8 + (-7) + 12 =$

30. $2 + 10 + 9 =$

31. $6 + 3 + (-1) =$

32. $-7 + (-9) + (-6) =$

33. $9 + 5 + 0 =$

34. $5 + (-8) + (-4) =$

35. $-3 + 7 + 5 =$

36. $-8 + (-6) + 2 =$

37. $4 + (-9) + 3 =$

38. $-7 + (-8) + (-9) =$

39. $-6 + 12 + 11 =$

40. $4 + (-6) + 9 =$

26

Name_____ Date _____

Lesson 1.2 Extra Practice

Find the sum.

1. $8 + 2$

2. $-5 + (-3)$

3. $-9 + (-3)$

4. $6 + (-6)$

5. $4 + (-4)$

6. $9 + (-6)$

7. $5 + (-2)$

8. $7 + (-13)$

9. $-18 + 1$

10. $-12 + (-5)$

11. $0 + (-7)$

12. $12 + (-15)$

13. Your bank account has a balance of $-\$21$. You deposit $\$50$. What is your new balance?

14. $7 + 5 + (-2)$

15. $-13 + 7 + (-3)$

16. $17 + (-5) + (-1)$

17. $4 + 8 + (-8)$

18. $-12 + (-4) + 9$

19. $-10 + 10 + (-3)$

20. $(-11) + 5 + (-12)$

21. $7 + 15 + (-7)$

22. $-12 + (-5) + (-10)$

23. $(-11) + 5 + (-12)$

24. $7 + 15 + (-7)$

25. $-12 + (-5) + (-10)$

26. $8 + (-9) + 3 + (-15)$

27. $3 + 17 + (-7) + (-3)$

28. $-9 + (-10) + (-8) + (-2)$

29. In golf, a golfer must have a score of 0 in order to be at par. A golfer scores 2 above par on the first hole, 1 below par on the second hole, and 2 below par on the third hole. Which expression can be used to decide whether the golfer is at par after the first three holes?

$\boxed{(-2) + 1 + 2}$ $\boxed{2 + (-1) + 2}$ $\boxed{2 + (-1) + (-2)}$

27

Name _____ Date _____

1.2 Puzzle Time

Why Did The Golfer Wear Two Pairs Of Pants?

Write the letter of each answer in the box containing the exercise number.

Find the sum.

1. $12 + 5$

2. $7 + (-7)$

3. $-10 + 2$

4. $9 + (-6)$

5. $-15 + 27$

6. $23 + (-23)$

7. $-17 + 12$

8. $13 + (-15)$

9. $-9 + (-9)$

10. $-14 + (-11)$

11. $12 + (-10) + 16$

12. $15 + (-15) + 12$

13. $-22 + 30 + (-26)$

14. $-8 + (-8) + (-9)$

15. $37 + (-21) + (-16)$

16. $-42 + 8 + 17$

17. $-30 + 34 + (-9)$

18. $14 + (-21) + 7$

19. $-25 + 17 + 6$

20. $-4 + (-8) + (-6)$

Answers	
S. 18	N. -18
O. 12	C. -8
L. -17	H. -25
I. -5	E. 0
T. 17	G. 3
A. -2	

21. A roller coaster climbs 84 feet on the first hill then drops 60 feet down. On the second hill the roller coaster climbs another 32 feet then drops 44 feet. What is the height at the end of the second hill?

7	13		3	8	11	15		14	18		4	21	1		19		10	12	16	2

17	9		5	20	6

Objective:

Example 1: Use the number line to find the sum.

a) $-4 - 1$

b) $-3 - (-7)$

```
 -5 -4 -3 -2 -1  0  1  2  3  4  5        -5 -4 -3 -2 -1  0  1  2  3  4  5
```
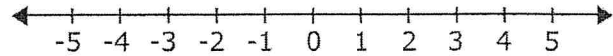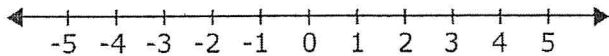
Key Ideas

Subtracting Integers

Subtracting integers is equivalent to _____ the _____.
Then, follow the rules of _____ integers.

Examples:

Example 2: Simplify the expression.

a) $-7 - 8$

b) $4 - 17$

c) $5 - (-3)$

Example 3: Simplify the expression.

a) $-1 - (-6) - 3$

b) $5 - 3 - (-19)$

c) $7 - (-2) - 10$

d) $32 - (-3) - (-11)$

e) $-40 - 16 + (-8) - (-2)$

f) $14 - 6 - (-11) + (-2)$

Example 4: Which continent has the greater range of elevations?

	South America	Europe
Highest Elevation	6960 m	5642 m
Lowest Elevation	-40 m	-92 m

Example 5: The temperature decreases from 52°F at 11:00 p.m. to 47°F at 12:00 a.m. The temperature changes by the same amount each hour until 5:00 a.m. Find the total change in temperature from 11:00 p.m. to 5:00 a.m.

Example 6: Simplify the expression.
$-2 - (-5) + (-1) - (-16) - 12 + 25 - (-10) - 14 + 3$

Subtracting Integers Worksheet 1

Name _____

Period _____

1. $6 - (-4) =$

2. $-2 - 5 =$

3. $4 - 9 =$

4. $-8 - (-6) =$

5. $-9 - 8 =$

6. $7 - 4 =$

7. $0 - (-2) =$

8. $-3 - 1 =$

9. $5 - (-5) =$

10. $-4 - 8 =$

11. $9 - 2 =$

12. $6 - 5 =$

13. $-8 - (-9) =$

14. $-7 - 3 =$

15. $2 - (-7) =$

16. $-4 - 6 =$

17. $1 - 9 =$

18. $-1 - (-2) =$

19. $10 - (-4) =$

20. $8 - (-7) =$

21. $-3 - (-4) =$

22. $5 - 1 =$

23. $-6 - 2 =$

24. $8 - (-3) =$

25. $-5 - (-1) =$

26. $-9 - 5 =$

27. $2 - 7 =$

28. $3 - (-7) =$

29. $-7 - (-3) =$

30. $2 - 8 =$

31. $-8 - (-5) =$

32. $4 - (-2) =$

33. $-9 - 3 =$

34. $7 - 5 =$

35. $-13 - 2 =$

36. $4 - (-3) =$

37. $-14 - 6 =$

38. $-3 - (-4) =$

39. $-3 - (-12) =$

40. $-8 - 7 =$

41. $2 - (-2) =$

42. $-5 - 7 =$

43. $-2 - (-4) =$

44. $4 - (-3) =$

45. $5 - 9 =$

46. $-4 - 0 =$

47. $2 - (-6) =$

48. $-8 - 5 =$

49. $9 - 7 =$

50. $0 - (-2) =$

51. $-4 - 8 =$

52. $-6 - (-9) =$

53. $-7 - 1 =$

54. $2 - 4 =$

55. $-3 - (-6) =$

56. $7 - 3 =$

57. $-8 - (-5) =$

58. $-5 - (-6) =$

59. $-14 - (-9) =$

60. $12 - (-11) =$

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Subtracting Integers Worksheet 2

Name _____

Period _____

1. $6 - (-4) - (-3) =$

2. $-2 - 5 - 5 =$

3. $4 - 9 - (-6) =$

4. $-8 - (-6) - 8 =$

5. $-9 - 8 - (-5) =$

6. $7 - 4 - (-9) =$

7. $0 - (-2) - 2 =$

8. $-3 - 1 - 3 =$

9. $5 - (-5) - (-7) =$

10. $-4 - 8 - 2 =$

11. $9 - 2 - (-8) =$

12. $6 - 5 - 4 =$

13. $-8 - (-9) - (-9) =$

14. $-7 - 3 - 7 =$

15. $2 - (-7) - (-13) =$

16. $-4 - 6 - 4 =$

17. $1 - 9 - (-14) =$

18. $-1 - (-2) - (-3) =$

19. $10 - (-4) - (-3) =$

20. $8 - (-7) - (-8) =$

21. $10 - (-3) - (-9) =$

22. $-5 - (-4) - 6 =$

23. $3 - 11 - (-8) =$

24. $9 - 2 - (-7) =$

25. $(-1) - (-5) - 11 =$

26. $-8 - 1 - 7 =$

27. $1 - 0 - (-10) =$

28. $7 - (-10) - (-8) =$

29. $-8 - (-7) - 12 =$

30. $2 - 10 - 9 =$

31. $6 - 3 - (-1) =$

32. $-7 - (-9) - (-6) =$

33. $9 - 5 - 0 =$

34. $5 - (-8) - (-4) =$

35. $-3 - 7 - 5 =$

36. $-8 - (-6) - 2 =$

37. $4 - (-9) - 3 =$

38. $-7 - (-8) - (-9) =$

39. $-6 - 12 - 11 =$

40. $4 - (-6) - 9 =$

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Name _____ Date _____

Find the difference.

1. $3 - 8$

2. $4 - (-5)$

3. $-6 - 4$

4. $-9 - (-6)$

5. $10 - (-9)$

6. $12 - 4$

7. $-15 - 7$

8. $-6 - (-14)$

9. $-1 - (-3)$

10. $15 - (-7)$

11. $20 - (-10)$

12. $-31 - 14$

13. You are scuba diving at -8 feet. You dive 5 feet deeper. What is your position in the water?

14. $8 - 12 - (-8)$

15. $3 - (-8) - 3$

16. $0 - (-4) - 4$

17. $9 - (-4) + (-9)$

18. $7 - 12 - (-12)$

19. $-11 - (-8) - (-3)$

20. Your friend finds the difference. Is your friend correct? Explain your reasoning.

$\boxed{-4 - (-8) = -12}$

21. The table shows the highest and lowest elevations for two cities.

   a. Find the range of elevations for Long Beach.

City	Highest elevation (feet)	Lowest elevation (feet)
Long Beach, CA	360	-7
New Orleans, LA	25	-8

   b. Find the range of elevations for New Orleans.

1.4 Puzzle Time

What Did The Sea Say To The Sand?

Write the letter of each answer in the box containing the exercise number.

Find the difference.

1. $3 - 11$

2. $-5 - 12$

3. $14 - (-10)$

4. $-9 - (-7)$

5. $25 - (-8)$

6. $-13 - (-13)$

Answers	
J. 24	H. 12
W. −8	G. 40
O. 33	E. −7
D. −2	I. 0
S. 25	N. −17
V. −3	A. −23
U. 13	T. 4

Evaluate the expression.

7. $-6 + 15 - (-4)$

8. $11 - 22 - (-8)$

9. $-14 - 7 - (-25)$

10. $17 + 8 - (-15)$

11. $-9 - (-4) - 2$

12. $-16 + 5 - 12$

13. The high temperature for a day in January was 7 degrees Fahrenheit. The low temperature that day was −5 degrees Fahrenheit. What is the difference in temperatures?

14. The top of a sailboat mast is 22 feet above the water surface. The bottom of the sailboat is 3 feet below the water surface. What is the difference in the elevations?

2	5	9	13	6	2	10		6	9		3	7	14	9		1	12	8	11	4

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Mixed Operations Worksheet

Name _____
Period _____

1. $6 - (-4) + (-3) - (-4) =$

2. $-2 - 5 + 5 - 1 =$

3. $4 - 9 + (-6) - 2 =$

4. $-8 - (-6) + 8 - (-3) =$

5. $-9 - 8 + (-5) - (-1) =$

6. $7 - 4 + (-9) - 5 =$

7. $0 - (-2) + 2 - 7 =$

8. $-3 - 1 + 3 - (-7) =$

9. $5 - (-5) + (-7) - (-3) =$

10. $-4 - 8 + 2 - 8 =$

11. $9 - 2 + (-8) - (-5) =$

12. $6 - 5 + 4 - (-2) =$

13. $-8 - (-9) + (-9) - 3 =$

14. $-7 - 3 + 7 - 5 =$

15. $2 - (-7) + (-13) - 2 =$

16. $-4 - 6 + 4 - (-3) =$

17. $1 - 9 + (-14) - 6 =$

18. $-1 - (-2) + (-3) - (-4) =$

19. $10 - (-4) + (-3) - (-12) =$

20. $8 - (-7) + (-8) - 7 =$

21. $10 - (-3) + (-9) - 5 =$

22. $-5 - (-4) + 6 - 8 =$

23. $3 - 11 + (-8) - (-4) =$

24. $9 - 2 + (-7) - 7 =$

25. $(-1) - (-5) + 11 - 6 =$

26. $-8 - 1 + 7 - 9 =$

27. $1 - 0 + (-10) - (-3) =$

28. $7 - (-10) + (-8) - (-5) =$

29. $-8 - (-7) + 12 - 10 =$

30. $2 - 10 + 9 - 2 =$

31. $6 - 3 + (-1) - (-4) =$

32. $-7 - (-9) + (-6) - 11 =$

33. $9 - 5 + 0 - 3 =$

34. $5 - (-8) + (-4) - (-1) =$

35. $-3 - 7 + 5 - 2 =$

36. $-8 - (-6) + 2 - (-9) =$

37. $4 - (-9) + 3 - (-12) =$

38. $-7 - (-8) + (-9) - (-10) =$

39. $-6 - 12 + 11 - 14 =$

40. $4 - (-6) + 9 - (-10) =$

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Objective:

Key Ideas

- **Multiplying/Dividing Integers with the Same Sign**
  The product/quotient of two nonzero integers with the same sign is _____.

  Examples:

- **Multiplying/Dividing Integers with Different Signs**
  The product/quotient of two nonzero integers with the different signs is _____.

  Examples:

- **Zero with Multiplication and Division**
  The product of any integer and 0 is _____.

  Examples:

  Zero divided by any integer is _____.

  Examples

  Division by zero is _____.

  Examples:

General Rule:
- When the number of negative signs is *even* (only when multiplying or dividing), then the answer is _____.

- When the number of negative signs is *odd*, (only when multiplying or dividing), then the answer is _____.

Example 1: Simplify the expression.

a) $(3)(-2)(-1)(-2)(2)(2)(-2)$

b) $(-3)(-2)(-1)(-2)(-2)(2)$

Example 2: Simplify the expression.

a) $2(-6) \div (-3)$

b) $24 - 3^2 \cdot 6$

c) $-8(-3)(-2)(-1)$

d) $4(5 - 11) + 2$

e) $-7(-14)(-13)(-15)(0)$

d) $2(55 \div 11 \cdot 3) + 2 \cdot 4$

Example 3: A roller coaster starts at a height of 45 meters. From the starting position, the roller coaster descends 3 meters per second for 5 seconds. How high is the roller coaster 5 seconds after the ride begins? Write an expression to represent the problem. Do not solve!

Example 4 (Textbook Page 52, Problem 17): Players in a racing game earn 3 points for each coin they collect. Each player loses 5 points for each second that he or she finishes after the first-place finisher. The table shows the results of a race. List the players in order from greatest to least.

Player	Coins	Time
1	31	0:02:03
2	18	0:01:55
3	24	0:01:58
4	27	0:02:01

Example 5: Find the mean of the integers: $3, -8, 1, -3, -6, 7$

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Name _____ Date _____

Extra Practice

Find the product.

1. $4 \cdot (-3)$

2. $-6 \cdot 5$

3. $-8(-2)$

4. $9 \cdot 6$

5. $0 \cdot (-7)$

6. $-12(-3)$

7. $11 \cdot 7$

8. $5(-5)$

9. $-13 \cdot 7$

10. $-1 \cdot 9$

11. $2(-12)$

12. $-9 \cdot (-9)$

13. A water tank leaks 5 gallons of water each day. What integer represents the change in the number of gallons of water in the tank after 7 days?

Evaluate the expression.

14. $2 \cdot (-3) \cdot 5$

15. $-5(-4)(-1)$

16. $7 \cdot 2 \cdot (-3)$

17. $0 \cdot (-8) \cdot 6$

18. $-6 \cdot 4 \cdot (-2)$

19. $5(-4)(-5)$

20. $(-3)^2$

21. -3^2

22. $(-2)^3$

23. -5^2

24. $-3 \cdot (-4)^2$

25. $(-7)^2 \cdot 2$

26. $(-2)^2 \cdot (-6)$

27. $-5(-2) - 3(-4)$

28. $2 \cdot (-3)^2 \cdot 5^2$

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Name _____ Date _____

2.1 Puzzle Time

When Do Kangaroos Celebrate Their Birthdays?

A	B	C	D	E	F		G	H	I	J		K	L	M	N

Complete each exercise. Find the answer in the answer column. Write the letter under the answer in the box containing the exercise letter.

36 G
12 O
−105 E
25 P
50 C
−60 D
72 S
45 N
−25 T
−42 U
49 P
−36 H
52 W
110 R

Multiply.

A. $5 \cdot (-12)$

B. $-14 \cdot 3$

C. $-10(-11)$

D. $8 \cdot (-7)$

E. $-9 \cdot (-5)$

F. $6(-2)(-3)$

G. $-4 \cdot 5 \cdot (-4)$

H. $(-7)(-3)(-5)$

I. $-15 \cdot 0 \cdot (-12)$

J. $(-5)^2$

K. -7^2

L. $-3^2 \cdot 8$

M. $(-4)^3$

N. You are making a necklace that is 9 inches long. You use 6 beads for each inch. What integer is the change in your supply of beads after making the necklace?

0 A
−25 M
−49 Y
−64 A
80 L
−50 U
100 B
64 F
−56 I
−110 J
66 S
−54 R
−72 E
54 K

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Lesson 2.2 **Reteach** (continued)

Remember to use the order of operations when evaluating expressions.

EXAMPLE Evaluating an Expression

Find the value of $\dfrac{x^2}{3y}$ **when** $x = -12$ **and** $y = -2$.

$\dfrac{x^2}{3y} = \dfrac{(-12)^2}{3(-2)}$ Substitute -12 for x and -2 for y.

$= \dfrac{(-12)(-12)}{3(-2)}$ Write $(-12)^2$ as repeated multiplication.

$= \dfrac{144}{3(-2)}$ Multiply -12 and -12. Because the integers have the same sign, the product is positive.

$= \dfrac{144}{-6}$ Multiply 3 and -2. Because the integers have different signs, the product is negative.

$= -24$ Divide 144 by -6. Because the integers have different signs, the quotient is negative.

▶ The value of the expression is -24.

Find the quotient, if possible.

1. $99 \div 9$

2. $121 \div (-11)$

3. $(-125) \div 5$

4. $(-56) \div (-7)$

5. $0 \div (-3)$

6. $(-3) \div 0$

7. $\dfrac{80}{-4}$

8. $\dfrac{-100}{-5}$

9. $\dfrac{-72}{6}$

10. $\dfrac{0}{-2}$

11. $\dfrac{-60}{-12}$

12. $\dfrac{-96}{8}$

Evaluate the expression.

13. $(-2)(-25) \div (-10) + 3$

14. $-10 + 10(-12) \div 6$

15. $(-4)(10) \div (-1) + 5$

16. $5 + 2(-4) \div 3$

17. $-20 \div (-2) + 3$

18. $6 \cdot -2 \div 4$

Evaluate the expression when $x = 30$, $y = -3$, **and** $z = -2$.

19. $x \div 2y$

20. $81 \div y^2$

21. $5yz^2 \div x$

22. $x \div (y + z)$

23. $\dfrac{x+y}{y}$

24. $\dfrac{-x+y}{z}$

25. $\dfrac{-90}{zy^2}$

26. $\dfrac{32y}{z^2}$

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Name _____

Period _____

Simplify each expression using the order of operations. Show your steps!

1) $24 + (-84 \div -6 - 16) - -9$

2) $49 \div -7 \cdot 6 - (-2)$

3) $-15 + 36 \div 6 \cdot -3 + -12$

4) $22 \div -11 \cdot 19 - (-5)$

5) $-23 + -80 \div -8 \cdot -4$

6) $-1 - (24 + -29 - (-27)) + 4$

7) $3 \cdot -4 + 12 - (-20)$

8) $28 - (-6) + 39 \div -3$

9) $18 - (-40 + -36) \div -4$

10) $-5 - 49 \div -7 \cdot 2$

42

11) $33 + (-22) \div 2 \cdot -4$

12) $23 - -5 + 5 \cdot -3$

13) $17 - (22 \cdot -1) \div -2$

14) $24 + (-84 \div -6) - 9$

15) $-36 \div -12 \cdot 3 - (-5)$

16) $-7 + (2 \cdot -3) \div (-6)$

17) $-12 - 28 \div -7 \cdot -3 - 12$

18) $-7 \cdot 5 - (-33) \div 11$

19) $14 + -14 \div -7 + -32 - (-8)$

20) $-255 \div -5 \cdot -2 - (-3)$

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Name _____

Period _____

Simplify each expression using the order of operations. Show your steps!

1) $-25 - (-96 \div -6 - 27) - (-3)^2 \cdot 5$

2) $-91 \div -7 \cdot (-3)^3 - (-8)$

3) $-15 + 72 \div (-3)^2 \cdot -3 - (-12)$

4) $77 \div -11 \cdot (-3) - (-5)^2$

5) $-23 + (-108) \div (-12) \cdot -2$

6) $-1 - (-23 + 13 - 6)^2 \div (-2)^3$

7) $9 \cdot -4 \div (-12) - (-20) - (-7)^2$

8) $-32 \div (-4)^2 - 39 \div -13$

9) $18 - (-40 + -36) \div -19 - (-1)^3$

10) $-13 + (-21 \div -7)^3 - (-32) \div (-8)$

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REVIEW:
Operations with Integers

Name _____
Period _____

Simplify each expression.

1) $-1 - 29 - 17 + -35$

2) $30 + -6 - 28$

3) $-13 + 33 - (-4) - 18 + 43$

4) $-3 \cdot -4 \cdot -10$

5) $34 + -27 + -31 - 21 - (-9)$

6) $-5 \cdot -3 \cdot -2 \cdot -1$

7) $(-2)(-1)(-4)$

8) $5 \cdot -3 \cdot -2 \cdot 1$

9) $-49 \div -7 \div 1$

10) $18 - 9 - 38$

11) $23 - (-5) + 5 - 7$

12) $24 + -18 + -1 + 36$

13) $-48 + (-40) + -38 - (-1) - 48$

14) $216 \div 6 \div -6 \div -1$

15) $14 + -21 - 30 + -18$

16) $-25 + -21$

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

7) _____

8) _____

9) _____

10) _____

11) _____

12) _____

13) _____

14) _____

15) _____

16) _____

45

17) −18 − 43 − (−33) − (−34) + 13

18) −2 + −2 − (−30)

17) _____

18) _____

19) 1 − 3 + 39

20) (−4)(−7)(8)

19) _____

20) _____

21) 29 − (−1) + 45

22) (2)(−1)(−1)(−1)(−1)

21) _____

22) _____

23) −144 ÷ 12 ÷ −12

24) 20 + −2

23) _____

24) _____

25) −72 ÷ −8

26) 16 − 5 + −15

25) _____

26) _____

27) (5)(−4)(−2)

28) 1 − 3 + 39

27) _____

28) _____

29) −29 − 31 − (−44) + −41

30) 17 − 28 + 27 − (−32) + 34

29) _____

30) _____

31) −31 + 35 − (−49)

32) (2)(−19)(−1)(−2)

31) _____

32) _____

33) 35 − 29 + −28 − (−39)

34) 2 + −3 − 4

33) _____

34) _____

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Name _____

Period _____

Simplify the expression by adding and/or subtracting.

1) $-25 - 10 - 12 - (-13)$

2) $10 - (-3) + (-4) - (-12)$

3) $-19 - (-30) + (-9) - (-11)$

4) $-42 + (-13) + (-12) - 15$

5) $20 + -11 + (-12) - (-12)$

6) $-6 + 15 - 16 - 17 - (16)$

7) $10 - (-5) + 30 + (-6) - 2$

8) $-35 - 25 - (-25) - (-35)$

Simplify the expression.

9) $-3 \cdot -14 \cdot -2$

10) $-48 \div 3 \div -4$

11) $\dfrac{-45}{-5}$

12) $\dfrac{3(-4+12)}{2}$

13) $3 \cdot 3 - (-18) \div 6$

14) $\dfrac{-3(9+-24)}{-10+-5}$

15) $81 \div -9 \cdot -2 - (-8)$

16) $4 \cdot -3 \div -12 + 8 - (-2)$

17) $(-10)(-4) \div (-2)$

18) $-3 - 4 - 6 - 7$

19) $(-1)(-1)(-2)(-3)(-4)$

20) $6 + 8 - (-8) - 10 + 11 - 8$

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Evaluate the expression.

21) $a(b - 1)^2$ if $a = -2$ and $b = 4$

22) $\frac{a}{2} - 4b + 2$ if $a = -6$ and $b = -1$

23) $3(x^2 + 4y - x)$ if $x = 5$ and $y = -5$

24) $\frac{4(rt + rw)}{r}$, if $r = 3$, $w = 1$, and $t = 5$

25) $x(r + w)^2 - ut$, if $x = 2$, $r = 3$, $w = 1$, $u = 4$, and $t = 5$

Express each phrase as an algebraic expression.

26) 4 times the quotient of a number g and 6

27) 7 more than the product of a number c and 7

28) 2 more than the quotient of a number b and 6

29) 11 less than the sum of a number v and 23

30) **Find the mean:** 12, −7, 6, 3, −4, −5, 2, 1

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