

## Mid- Winter Break Packet

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Score: \_\_\_\_\_/50 (winter packet)

\_\_\_\_\_/40 (2/10 - 2/14 Week Packet)

a) Find the sum of  $2x + 1$  and  $5x$ .

b) Find the sum of  $-3a + 2$  and  $5a - 3$ .

c) Find the product of  $2x$  and  $3$ .

**Example 3: Any Order, Any Grouping in Expressions with Addition and Multiplication**

Use any order, any grouping to write equivalent expressions.

a.  $3(2x)$

b.  $4y(5)$

c.  $4 \cdot 2 \cdot z$

d.  $3(2x) + 4y(5)$

e.  $3(2x) + 4y(5) + 4 \cdot 2 \cdot z$

- f. Alexander says that  $3x + 4y$  is equivalent to  $(3)(4) + xy$  because of any order, any grouping. Is he correct? Why or why not?

The problems below are follow-up questions to Example 1, part (b) from Classwork: Find the sum of  $2x + 1$  and  $5x$ .

2. Jack got the expression  $7x + 1$  and then wrote his answer as  $1 + 7x$ . Is his answer an equivalent expression? How do you know?
3. Jill also got the expression  $7x + 1$ , and then wrote her answer as  $1x + 7$ . Is her expression an equivalent expression? How do you know?

**Example 1: Subtracting Expressions**

a. Subtract:  $(40 + 9) - (30 + 2)$ .

b. Subtract:  $(3x + 5y - 4) - (4x + 11)$ .

**Example 2: Combining Expressions Vertically**

a. Find the sum by aligning the expressions vertically.

$$(5a + 3b - 6c) + (2a - 4b + 13c)$$

b. Find the difference by aligning the expressions vertically.

$$(2x + 3y - 4) - (5x + 2)$$

### Example 3: Using Expressions to Solve Problems

A stick is  $x$  meters long. A string is 4 times as long as the stick.

- a. Express the length of the string in terms of  $x$ .
- b. If the total length of the string and the stick is 15 meters long, how long is the string?

### Example 4: Expressions from Word Problems

It costs Margo a processing fee of \$3 to rent a storage unit, plus \$17 per month to keep her belongings in the unit. Her friend Carissa wants to store a box of her belongings in Margo's storage unit and tells her that she will pay her \$1 toward the processing fee and \$3 for every month that she keeps the box in storage. Write an expression in standard form that represents how much Margo will have to pay for the storage unit if Carissa contributes. Then, determine how much Margo will pay if she uses the storage unit for 6 months.



**Lesson Summary**

Terms that contain exactly the same variable symbol can be combined by addition or subtraction because the variable represents the same number. Any order, any grouping can be used where terms are added (or subtracted) in order to group together like terms. Changing the orders of the terms in a sum does not affect the value of the expression for given values of the variable(s).

**Problem Set**

For Problems 1–9, write equivalent expressions by combining like terms. Verify the equivalence of your expression and the given expression by evaluating each for the given values:  $a = 2$ ,  $b = 5$ , and  $c = -3$ .

1.  $3a + 5a$

2.  $8b - 4b$

3.  $5c + 4c + c$

4.  $3a + 6 + 5a$

5.  $8b + 8 - 4b$

6.  $5c - 4c + c$

7.  $3a + 6 + 5a - 2$

8.  $8b + 8 - 4b - 3$

9.  $5c - 4c + c - 3c$

Use any order, any grouping to write equivalent expressions by combining like terms. Then, verify the equivalence of your expression to the given expression by evaluating for the value(s) given in each problem.

10.  $3(6a)$ ; for  $a = 3$

11.  $5d(4)$ ; for  $d = -2$

12.  $(5r)(-2)$ ; for  $r = -3$

13.  $3b(8) + (-2)(7c)$ ; for  $b = 2$ ,  $c = 3$

14.  $-4(3s) + 2(-t)$ ; for  $s = \frac{1}{2}$ ,  $t = -3$

15.  $9(4p) - 2(3q) + p$ ; for  $p = -1$ ,  $q = 4$

16.  $7(4g) + 3(5h) + 2(-3g)$ ; for  $g = \frac{1}{2}$ ,  $h = \frac{1}{3}$

### Lesson Summary

Rewrite subtraction as adding the opposite before using any order, any grouping.

Rewrite division as multiplying by the reciprocal before using any order, any grouping.

The opposite of a sum is the sum of its opposites.

Division is equivalent to multiplying by the reciprocal.

### Problem Set

2. Write each expression in standard form. Verify that your expression is equivalent to the one given by evaluating each expression using  $x = 5$ .

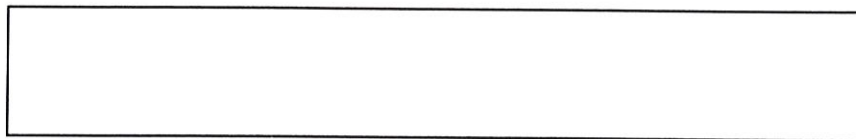
c. $3x + (2 - 4x)$	d. $3x + (-2 + 4x)$	e. $-3x + (2 + 4x)$
f. $3x + (-2 - 4x)$	g. $3x - (2 + 4x)$	h. $3x - (-2 + 4x)$
i. $3x - (-2 - 4x)$	j. $3x - (2 - 4x)$	k. $-3x - (-2 - 4x)$

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2. Write each expression in standard form. Verify that your expression is equivalent to the one given by evaluating each expression for the given value of the variable.

a. $4y - (3 + y); y = 2$	b. $(2b + 1) - b; b = -4$	c. $(6c - 4) - (c - 3); c = -7$
d. $(d + 3d) - (-d + 2); d = 3$	e. $(-5x - 4) - (-2 - 5x); x = 3$	f. $11f - (-2f + 2); f = \frac{1}{2}$
g. $-5g + (6g - 4); g = -2$	h. $(8h - 1) - (h + 3); h = -3$	i. $(7 + w) - (w + 7); w = -4$
j. $(2g + 9h - 5) - (6g - 4h + 2); g = -2 \text{ and } h = 5$		



**Problem Set**

1. Write each expression as the product of two factors.

k.  $1 \cdot 3 + 7 \cdot 3$

l.  $(1 + 7) + (1 + 7) + (1 + 7)$

m.  $2 \cdot 1 + (1 + 7) + (7 \cdot 2)$

n.  $h \cdot 3 + 6 \cdot 3$

o.  $(h + 6) + (h + 6) + (h + 6)$

p.  $2h + (6 + h) + 6 \cdot 2$

q.  $j \cdot 3 + k \cdot 3$

r.  $(j + k) + (j + k) + (j + k)$

s.  $2j + (k + j) + 2k$

3. Write each sum as a product of two factors.

a.  $6 \cdot 7 + 3 \cdot 7$

b.  $(8 + 9) + (8 + 9) + (8 + 9)$

c.  $4 + (12 + 4) + (5 \cdot 4)$

d.  $2y \cdot 3 + 4 \cdot 3$

e.  $(x + 5) + (x + 5)$

f.  $3x + (2 + x) + 5 \cdot 2$

g.  $f \cdot 6 + g \cdot 6$

h.  $(c + d) + (c + d) + (c + d) + (c + d)$

i.  $2r + r + s + 2s$

4. Write the sum as a product of two factors.

a.  $81w + 48$

b.  $10 - 25t$

c.  $12a + 16b + 8$

5. Xander goes to the movies with his family. Each family member buys a ticket and two boxes of popcorn. If there are five members of his family, let  $t$  represent the cost of a ticket and  $p$  represent the cost of a box of popcorn. Write two different expressions that represent the total amount his family spent. Explain how each expression describes the situation in a different way.

6. Write each expression in standard form.

a.  $-3(1 - 8m - 2n)$

b.  $5 - 7(-4q + 5)$

c.  $-(2h - 9) - 4h$

d.  $6(-5r - 4) - 2(r - 7s - 3)$

7. Write each expression in standard form. Verify that your expression is equivalent to the one given by evaluating both expressions for the given value of the variable.

a. $-3(8x); x = \frac{1}{4}$	b. $5 \cdot k \cdot (-7); k = \frac{3}{5}$	c. $2(-6x) \cdot 2; x = \frac{3}{4}$
d. $-3(8x) + 6(4x); x = 2$	e. $8(5m) + 2(3m); m = -2$	f. $-6(2v) + 3a(3); v = \frac{1}{3}; a = \frac{2}{3}$

8. Write each expression in standard form. Verify that your expression is equivalent to the one given by evaluating both expressions for the given value of the variable.

a. $8x \div 2; x = -\frac{1}{4}$	b. $18w \div 6; w = 6$	c. $25r \div 5r; r = -2$
d. $33y \div 11y; y = -2$	e. $56k \div 2k; k = 3$	f. $24xy \div 6y; x = -2; y = 3$

3. For each problem (a)–(g), write an expression in standard form.

g. Find the sum of  $-3x$  and  $8x$ .



- h. Find the sum of  $-7g$  and  $4g + 2$ .
- i. Find the difference when  $6h$  is subtracted from  $2h - 4$ .
- j. Find the difference when  $-3n - 7$  is subtracted from  $n + 4$ .
- k. Find the result when  $13v + 2$  is subtracted from  $11 + 5v$ .
- l. Find the result when  $-18m - 4$  is added to  $4m - 14$ .
- m. What is the result when  $-2x + 9$  is taken away from  $-7x + 2$ ?

## **WORKSHEET 3**

1- Find the mean of following data: 10, 15, 12, 9, 2, 6.

- A. 12
- B. 9
- C. 54
- D. 10.9

2- What is the median of following data?

5, 7, 10, 3, 8

- A. 7.5
- B. 7
- C. 6
- D. 10

3- If the number of books in a sample of eight boxes is as follows:

11, 8, 2, 2, 7, 7, 2, 5, then the data set is said to be .....

- A. multimodal
- B. unimodal
- C. bimodal
- D. having no mode

4- Find the midrange for the following data:

7, -5, 2, 10, 15

- A. 2
- B. 5
- C. -5
- D. 10

5- If the mean of 5 values equals 64, then  $\sum X = ?$

- A. 12.8
- B. 320
- C. 69
- D. 200

6- The measures of central tendency for the data set 1, 3, 9, 11, 2 are:

- A. Mean=5.2    median=3    mode=no mode
- B. Mean=5.2    median=9    mode=zero
- C. Mean=5.2    median=3    mode=zero
- D. Mean=5.2    median=9    mode=no mode

**7- The costs of six toys in a certain store are:**

**\$15, \$20, \$32, \$1,250, \$27, \$50**

**Which measure of central tendency should be used?**

- A. Mode
- B. Mean
- C. Midrange
- D. Median

**8- What is the appropriate measure for the data that represent the marital status (married, divorced, widowed, single)?**

- A. Median
- B. Midrange
- C. Mean
- D. Mode

**9- When the distribution is positively skewed, the relationship between the mean, median and mode will be:**

- A. Mean = Median = Mode
- B. Mean > Median > Mode
- C. Mean < Median < Mode
- D. Cannot be determined

**10- If the CVar for an English test is 6.9%, and the CVar for a history test is 4.9%, compare the variations.**

- A. The English test is more variable
- B. The history test is more variable
- C. Both tests have the same variation
- D. Cannot be determined

**11- If the mean of the number of sales of houses is 56, and the variance is 36, then the coefficient of variation is .....**

- A. 10.7%
- B. 0.643%
- C. 64.3%
- D. 0.107%

**12- The mean of a distribution is 80, and the standard deviation is 7. If the distribution is bell-shaped, approximately 99.7% of the data values will fall between .....**

- A. 59 and 94
- B. 59 and 101
- C. 66 and 94
- D. 66 and 101

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Name \_\_\_\_\_

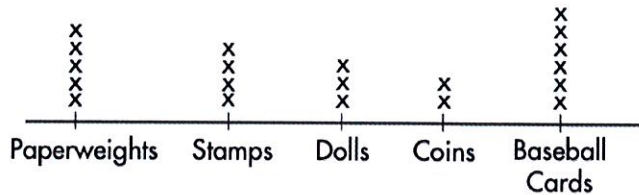
# Class Surveys

The students in Ms. Young's fifth-grade class completed several surveys and then organized the results in different graphs.

## Decision Making

Use the line plot below to answer questions 1 and 2.

**Students in Ms. Young's Class**



**Survey Results**

1. How many students responded to this survey? \_\_\_\_\_

2. What question do you think was asked for this survey?  
\_\_\_\_\_

Use the frequency tables below for questions 3 and 4.

Favorite Dessert	
Apple pie	2
Brownies	4
Chocolate cake	6
Ice cream	7
Fruit	1

Second-Favorite Dessert	
Apple pie	6
Brownies	2
Chocolate cake	6
Ice cream	4
Fruit	2

3. The school needs to choose two types of desserts to serve at a class picnic. Which two desserts would you suggest?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. If the school needed to choose only one type of dessert to be served at the class picnic, which dessert would you suggest?  
\_\_\_\_\_  
\_\_\_\_\_