St. Mary of the Hills School

Summer 2023

Math Packet

For

Students entering Grade 7

Directions:

- Work on packet 2-3 times a week.
- Complete all problems.
- Pencil ONLY.
- Show All Work! No work = No credit
- Calculators are not allowed.
- Summer Math Packet will be a Test Grade.
- Due Date: September 8, 2023

Student's Name:

_____

Parent's/ Guardian's

Signature:

_____

Name _____ Date _____

Practice 2.2

Multiply Whole Numbers

Find each product. Estimate to see if your answer is reasonable.

1. 15 × 62	**2.** 59 × 37	**3.** 72 × 29
4. 38 × 46	**5.** 92 × 73	**6.** 526 × 64
7. 592 × 65	**8.** 521 × 394	**9.** 638 × 246
10. 193 × 397	**11.** 538 × 263	**12.** 634 × 195

Mental Math **Find each product using mental math.**

13. 31 × 40	**14.** 670 × 20	**15.** 420 × 30
16. 700 × 35	**17.** 520 × 600	**18.** 600 × 43
19. 960 × 100	**20.** 540 × 300	**21.** 630 × 700

Test Prep

22. Which of the following is the product of 524 × 130?

A 6,812 **C** 68,020

B 16,144 **D** 68,120

23. The old theater had 38 rows of 15 seats each. The new theater will have 36 rows of 16 seats. Will the old or the new theater have more seats? How many more? Explain how you got your answer.

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Use with text pages 34–35.

Name _____ Date _____

Practice 2.4

Divide by Two-Digit Divisors

Estimate the quotient, using compatible numbers. Write the compatible numbers you used.

1. $149 \div 16$ _____
2. $567 \div 83$ _____
3. $2{,}512 \div 53$ _____

Divide. Then use estimation or multiplication to check your answer.

4. $12\overline{)459}$
5. $27\overline{)562}$
6. $36\overline{)4{,}296}$
7. $49\overline{)2{,}768}$
8. $54\overline{)5{,}683}$
9. $74\overline{)45{,}529}$
10. $61\overline{)59{,}777}$
11. $72\overline{)38{,}452}$
12. $42\overline{)52{,}436}$

Mental Math Divide, using mental math.

13. $30\overline{)960}$
14. $40\overline{)160}$
15. $25\overline{)7{,}550}$

Algebra • Functions Find each missing value of *y*.

16.

Rule: $y = x \div 45$			
x	855	2,790	8,640
y			

17.

Rule: $y = 1{,}890 \div x$			
x	2	5	6
y			

Test Prep

18. Which is the correct answer to $25{,}897 \div 46$?

A 541 R11
C 562 R45
B 562
D 563

19. A school bought 2,619 new books. If each of 25 classrooms is to receive about the same number of books, about how many books will each classroom receive?

_____

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Name _____ Date _____

Practice 5.4

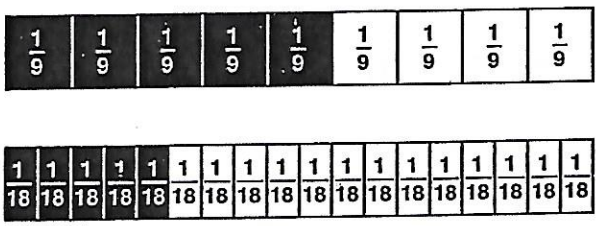
Subtract With Unlike Denominators

Find each difference. Write your answer in simplest form.

1. $1\frac{3}{4} - \frac{2}{3}$ _____
2. $3\frac{1}{4} - 1\frac{1}{8}$ _____
3. $7\frac{2}{3} - 4$ _____
4. $2\frac{1}{2} - 1\frac{7}{8}$ _____
5. $4\frac{1}{3} - 1\frac{3}{4}$ _____
6. $3\frac{5}{6} - 2\frac{2}{3}$ _____
7. $4\frac{5}{8} - 1\frac{1}{3}$ _____
8. $2\frac{5}{6} - 1\frac{5}{8}$ _____
9. $9\frac{4}{7} - 3$ _____
10. $3\frac{1}{2} - 1\frac{4}{7}$ _____
11. $4\frac{7}{8} - 1\frac{11}{12}$ _____
12. $5\frac{1}{6} - 1\frac{5}{8}$ _____
13. $4\frac{2}{7} - 1\frac{1}{2}$ _____
14. $3\frac{3}{4} - 1\frac{5}{8}$ _____
15. $4\frac{5}{6} - 1\frac{3}{8}$ _____

Write and solve a subtraction problem for each model.

16.



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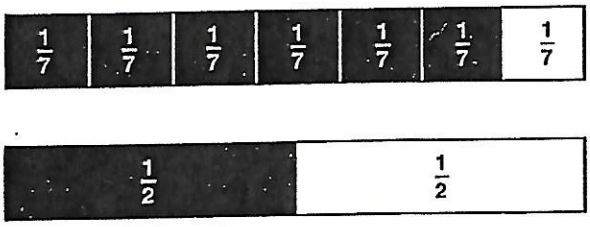
17.



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Algebra • Equations **Use mental math and the properties for addition to find the value of *n* in each equation.**

18. $n + 2\frac{3}{4} = 4$ _____
19. $n - 1\frac{5}{8} = 3$ _____
20. $n - \frac{3}{4} = \frac{1}{12}$ _____
21. $6\frac{5}{8} - n = 4$ _____

Test Prep

22. What is $2\frac{1}{8} - 1\frac{3}{4}$?

A $\frac{3}{8}$ C $1\frac{5}{8}$

B $1\frac{1}{2}$ D $3\frac{7}{8}$

23. Tomi measures $48\frac{1}{4}$ inches tall, while Sheri measures $46\frac{3}{8}$ inches tall. Explain how to find how much taller Tomi is than Sheri.

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Use with text pages 116–119.

Name _____ Date _____

Prac
2.

Divide by One-Digit Divisors

Divide. Then check your work.

1. $8\overline{)452}$
2. $4\overline{)679}$
3. $3\overline{)512}$
4. $6\overline{)248}$
5. $7\overline{)576}$
6. $4\overline{)634}$
7. $5\overline{)563}$
8. $7\overline{)624}$
9. $9\overline{)457}$
10. $3\overline{)912}$
11. $6\overline{)4,572}$
12. $8\overline{)3,945}$
13. $5\overline{)25,704}$
14. $9\overline{)48,312}$
15. $7\overline{)65,348}$
16. $4\overline{)56,379}$
17. $3\overline{)28,730}$
18. $6\overline{)78,514}$
19. $7\overline{)315,648}$
20. $8\overline{)638,945}$
21. $5\overline{)502,468}$

Test Prep

22. What is the remainder for $6\overline{)512,892}$?

A 0 C 3

B 1 D 6

23. On Monday, Zoe began reading a b
from page 1. On Friday, she had re
to page 180. If she read the same n
of pages each day, how many page
she read on Wednesday?

_____

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Name _____ Date _____

Practice 6.2

Multiply Fractions

Multiply. Write each product in simplest form.

1. $\frac{1}{2} \times \frac{2}{3}$ _____

2. $\frac{2}{3} \times \frac{9}{10}$ _____

3. $\frac{2}{7} \times \frac{5}{12}$ _____

4. $\frac{2}{3} \times \frac{3}{5}$ _____

5. $\frac{4}{9} \times 36$ _____

6. $\frac{3}{4} \times \frac{4}{15}$ _____

7. $\frac{8}{9} \times 72$ _____

8. $\frac{11}{12} \times \frac{4}{5}$ _____

9. $\frac{3}{5} \times \frac{20}{21}$ _____

10. $\frac{6}{7} \times 21$ _____

11. $\frac{5}{6} \times \frac{12}{25}$ _____

12. $\frac{2}{9} \times \frac{15}{16}$ _____

Algebra • Expressions **Write each expression as a single fraction.**

13. $\frac{a}{b} \times \frac{1}{d}$ _____

14. $\frac{b}{h} \times 4$ _____

15. $\frac{m}{n} \times \frac{x}{y}$ _____

16. $\frac{1}{k} \times 8$ _____

17. $\frac{t}{v} \times \frac{r}{w}$ _____

18. $\frac{m}{d} \times \frac{d}{p}$ _____

19. $\frac{2}{r} \times \frac{1}{4}$ _____

20. $\frac{u}{f} \times 3$ _____

21. $\frac{1}{r} \times \frac{1}{s}$ _____

Test Prep

22. What is the product of $\frac{8}{9} \times \frac{15}{16}$ written in simplest form?

A $\frac{120}{144}$

C $\frac{15}{18}$

B $\frac{60}{72}$

D $\frac{5}{6}$

23. April wants to save $\frac{4}{5}$ of all money she earns walking dogs on the weekend. If she made $40 on Saturday, how much should she save?

_____

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Name _____ Date _____

Practice 5.3

Add With Unlike Denominators

Find each sum. Write your answer in simplest form.

1. $\frac{1}{2} + \frac{2}{3}$ _____
2. $\frac{1}{4} + \frac{3}{8} + 1\frac{5}{8}$ _____
3. $\frac{2}{3} + \frac{5}{6}$ _____
4. $\frac{1}{4} + \frac{5}{12}$ _____
5. $\frac{1}{5} + \frac{5}{6}$ _____
6. $\frac{3}{8} + \frac{1}{6}$ _____
7. $1\frac{2}{3} + \frac{5}{12}$ _____
8. $2\frac{1}{4} + \frac{5}{6}$ _____
9. $\frac{1}{3} + \frac{3}{4} + \frac{5}{6}$ _____
10. $1\frac{3}{8} + 2\frac{1}{6}$ _____
11. $1\frac{9}{10} + 2\frac{1}{2}$ _____
12. $\frac{3}{5} + 1\frac{7}{10}$ _____
13. $\frac{3}{4} + \frac{5}{8} + \frac{7}{16}$ _____
14. $2\frac{1}{3} + \frac{5}{6}$ _____
15. $1\frac{1}{2} + 2\frac{1}{3} + 4\frac{5}{6}$ _____
16. $1\frac{3}{4} + 2\frac{1}{6}$ _____
17. $1\frac{1}{2} + 2\frac{2}{5}$ _____
18. $1\frac{5}{6} + 1\frac{3}{8}$ _____
19. $\frac{4}{5} + \frac{2}{3} + \frac{4}{15}$ _____
20. $1\frac{3}{4} + 2\frac{5}{12}$ _____
21. $1\frac{2}{5} + 3\frac{3}{10}$ _____

Mental Math **Use mental math to find each sum.**

22. $\frac{1}{4} + 1\frac{3}{8} + 1\frac{5}{8}$ _____
23. $\frac{5}{8} + \frac{2}{3} + \frac{3}{8}$ _____
24. $1\frac{3}{4} + \frac{9}{10} + 2\frac{1}{4}$ _____
25. $2\frac{5}{9} + 1\frac{5}{6} + \frac{4}{9}$ _____
26. $\frac{2}{3} + 2\frac{1}{3} + \frac{4}{7}$ _____
27. $1\frac{9}{10} + \frac{7}{8} + 2\frac{1}{10}$ _____

Algebra • Properties **Use addition properties to find the value of *n*.**

28. $\frac{5}{8} + n = \frac{5}{8}$ _____
29. $\frac{4}{5} + \frac{2}{6} = \frac{2}{6} + n$ _____
30. $\frac{3}{12} + \frac{5}{12} + \frac{3}{12} + n = 1$ _____
31. $\frac{6}{4} + \frac{2}{4} + n = 2$ _____

Test Prep

32. The LCM of 12 and 18 is

A 12 C 36

B 18 D 216

33. To add $\frac{2}{5} + \frac{4}{15}$, Leesa used the denominator 30 to rename the fractions. Will the denominator of 30 work? Explain.

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Name: _____ Date: _____

Adding Integers Worksheet

Add the following integers together and determine which rule was used to determine the answer.

1. 35 + 19 = _____
2. −5 + 5 = _____
3. −15 + −8 = _____
4. 34 + −45 = _____
5. 12 + −12 = _____
6. −23 +78 = _____
7. 17 + 19 = _____
8. −6 + 40 = _____
9. −3 + 30 = _____
10. 11 + 18 = _____

Solve the following addition problems that have several integers:

11. −6 + (−3) +5 + 7 + (−8) = _____
12. 7 + 8 + (−4) + 7 + (−7) = _____
13. −3 + (−4) + 5 + (−8) + 5 = _____
14. 2 + 5 + (−9) + 5 + (−8) = _____

lame

Date

Subtracting integers

Integer Exploration

Every integer has an opposite. An integer and its opposite are called additive inverses of each other. For example, 3 has an opposite of -3. If 3 and -3 are added together, their sum is 0. The sum of any integer and its opposite will always have a result of 0.

$3 + (-3) = 0$

$-8 + 8 = 0$

To subtract an integer, simply add its opposite. Thus, change the subtraction problem to an addition problem and solve using the rules already learned for addition of integers.

Subtract $10 - 12$

$10 + (-12)$	Change to addition by adding the opposite of 12.
$\|-12\| - \|10\|$	Subtract absolute values.
$12 - 10$	
-2	Give result a negative sign since -12 has the greater absolute value.

Subtract $6 - (-13)$

$6 + 13$	Change to addition by adding the opposite of -13.
19	Result is positive since adding numbers with the same positive sign.

ıange each problem to an addition problem. Tell whether each answer will be **positive**, **gative**, or **zero**.

. $1 - 3$

2. $10 - (-5)$

3. $-8 - 14$

$-4 - 7$

5. $-2 - (-12)$

6. $20 - 18$

ve each expression.

$-10 - 6$

8. $12 - (-9)$

$-13 - (-8)$

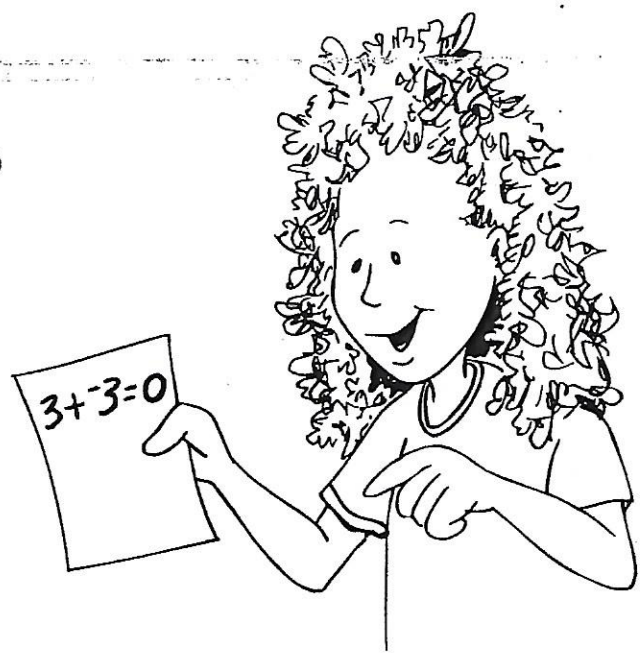
10. $7 - 16$

$24 - (-26)$

12. $-5 - 15$

$-40 - 3$

14. $23 - 30$



Explain how the subtraction of integers is related to the addition of integers.

Name Date

Adding integers

Two situations are possible when adding integers: adding integers with same signs and adding integers that have different signs. Remember these two rules when faced with these situations:

1. To add integers that have the same sign, simply add their absolute values. Give the result the same sign as the integers.

   $3 + 5$
   $|3| + |5|$
   8 Answer is positive since the integers were both positive.

   $-4 + (-7)$
   $|-4| + |-7|$
   $4 + 7$
   -11 Answer is negative since the integers were both negative.

2. To add integers that have different signs, subtract their absolute values. Give the result the same sign as the integer with the greater absolute value.

   $-7 + 5$
   $|-7| - |5|$
   $7 - 5$ Subtract absolute values.
   -2 Answer is negative because -7 has the greater absolute value.

State whether each sum is **positive**, **negative**, or **zero**.

1. $-3 + 5$

2. $16 + (-16)$

3. $25 + 45$

4. $-150 + 125$

5. $4 + (-11)$

6. $-11 + (-12)$

Find each sum.

7. $17 + (-6)$

8. $-8 + 3$

9. $9 + (-4)$

10. $-13 + (-10)$

11. $-12 + (-8)$

12. $-5 + (-15)$

13. Write an addition sentence for the following situation, then solve. Bob made a profit of $4,500 last year and had a loss of $4,800 this year.

Name Date

Symbol translation

Basics of Algebra

Often it is essential to translate words into symbols in order to solve a mathematical problem. Below is a chart with some commonly-used mathematical words and phrases with their possible meanings.

+	−	x	÷
add	subtract	multiply	divide
plus	minus	times	divided by
more than	less than	product of	divided into
sum of	difference	twice	quotient
increased by	decreased by	multiplied by	
added to	subtracted from		

Also, a number can be represented by any variable. It is important to be very careful when arranging the order of terms.

Translate the following phrases into symbols:

1. four more than a number — $x + 4$
2. five subtracted from a number — $x - 5$
3. subtract a number from nine — $9 - x$
4. eight divided by the sum of a number and ten — $8 \div (x + 10)$

Translate each phrase into an algebraic expression.

1. a number divided by nine

2. five less than a number

3. the sum of a number and ten

4. the product of three and a number

5. twice a number

6. three times a number decreased by two

7. the difference of twelve and a number

8. four more than five times a number

Write a verbal phrase for each algebraic expression.

9. $x + 7$

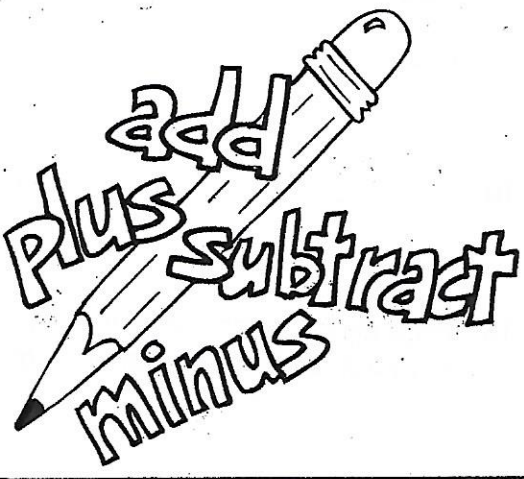
10. $b \div 9$

11. $13 - a$

12. $2(y + 4)$

13. $8n$

14. $4z - 6$



Name: _____ Date: _____

Subtracting Integers Worksheet

Subtract the following integers. Show your work on the lines provided.

1. $34 - 12 =$ _____ _____
2. $-34 - 15 =$ _____ _____
3. $-14 - 47 =$ _____ _____
4. $4 - 14 =$ _____ _____
5. $-23 - 9 =$ _____ _____
6. $3 - 17 =$ _____ _____
7. $-3 - 45 =$ _____ _____
8. $-6 - (-6) =$ _____ _____
9. $-15 - 15 =$ _____ _____
10. $67 - 19 =$ _____ _____

11. Write the rule pertaining to subtracting two integers:

_____

_____

_____

Name: _____ Date: _____

Subtracting Integers

Subtract the following integers. Show your work on the lines provided.

1. $7 - (-3) =$ _____ _____
2. $-15 - 8 =$ _____ _____
3. $-7 - 23 =$ _____ _____
4. $-12 - 15 =$ _____ _____
5. $-6 - (23) =$ _____ _____
6. $-4 - 16 =$ _____ _____
7. $-8 - (-8) =$ _____ _____
8. $-31 - (-25) =$ _____ _____
9. $-6 - (-6) =$ _____ _____
10. $34 - (-45) =$ _____ _____

Name

Date

Subtracting integers

Integer Exploration

Every integer has an opposite. An integer and its opposite are called additive inverses of each other. For example, 3 has an opposite of -3. If 3 and -3 are added together, their sum is 0. The sum of any integer and its opposite will always have a result of 0.

$3 + (-3) = 0$

$-8 + 8 = 0$

To subtract an integer, simply add its opposite. Thus, change the subtraction problem to an addition problem and solve using the rules already learned for addition of integers.

Subtract $10 - 12$

$10 + (-12)$	Change to addition by adding the opposite of 12.
$\|-12\| - \|10\|$	Subtract absolute values.
$12 - 10$	
-2	Give result a negative sign since -12 has the greater absolute value.

Subtract $6 - (-13)$

$6 + 13$	Change to addition by adding the opposite of -13.
19	Result is positive since adding numbers with the same positive sign.

Change each problem to an addition problem. Tell whether each answer will be **positive**, **negative**, or **zero**.

1. $1 - 3$

2. $10 - (-5)$

3. $-8 - 14$

4. $-4 - 7$

5. $-2 - (-12)$

6. $20 - 18$

Solve each expression.

7. $-10 - 6$

8. $12 - (-9)$

9. $-13 - (-8)$

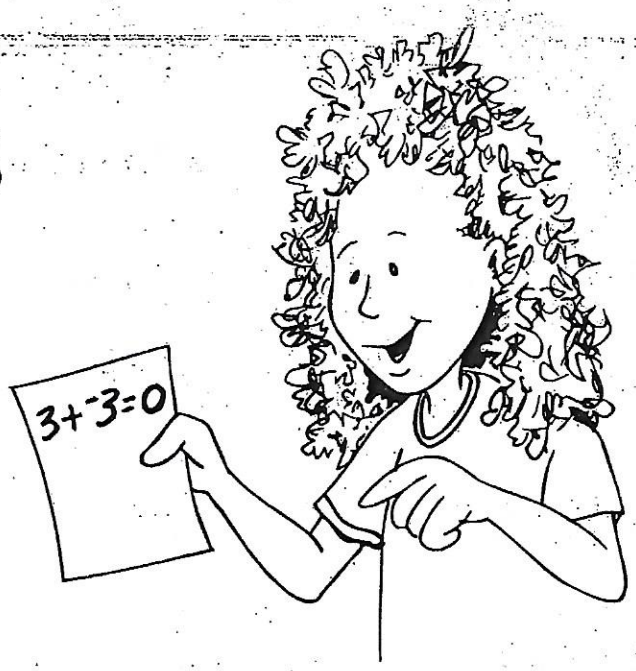
10. $7 - 16$

11. $24 - (-26)$

12. $-5 - 15$

13. $-40 - 3$

14. $23 - 30$



15. Explain how the subtraction of integers is related to the addition of integers.

Name Date

Multiplying integers

Integer Exploration

Multiplying integers is just like multiplying positive whole numbers except there is a possibility of negative numbers. Remember the following rules when multiplying integers:

1. The product of two integers with the same sign is positive.
   Multiply 12 x 2
   24 Result is a positive 24 since both integers were positive.
   Multiply -4 • (-9)
   36 Result is a positive 36 since both integers were negative.
2. The product of two integers with different signs is negative.
   Multiply -5 x 7
   -35 Result is a negative 35 since the integers had different signs.

Look at the following example with multiplying 3 integers.

Multiply -3(-4)(-5)

12(-5) Multiply -3 and -4 and the result is a positive 12.

-60 Result is negative since multiplying integers with different signs.

State whether each product is **positive**, **negative**, or **zero**.

1. 7 x 4

2. -3 x (-5)

3. -7 x 0

4. 6 x (-8)

5. -9 • 9

6. -2 x (-11)

Solve each expression.

7. -10 x 7

8. -16 • (-2)

9. -12 x (-11)

10. -15 x 0

11. 5 x 8

12. 8 x (-10)

13. 6 x (-20)

14. -3 • 13

15. Multiply (-2)(-3)(4). Multiply (-5)(-6)(-1).

Looking at the number of negative signs in both problems, write a rule that will help determine the sign of the product if multiplying two or more integers.

Name

Date

Dividing integers

Integer Exploration

When dividing integers, it is important to remember the following rules:

1. When dividing two integers with the same sign, the quotient is positive.

   Divide $-10 \div (-5)$

   2

   Result is a positive 2 since both integers had the same sign.

   Divide $\frac{60}{5}$

   12

   Result is a positive 12 since both integers had the same sign.

2. When dividing two integers with different signs, the quotient is negative.

   Divide $-45 \div 9$

   -5

   Result is a negative 5 since integers had different signs.

Note: The rules are the same for multiplication of integers as they are for the division of integers.

State whether each quotient is **positive**, **negative**, or **zero**.

1. $9 \div 3$

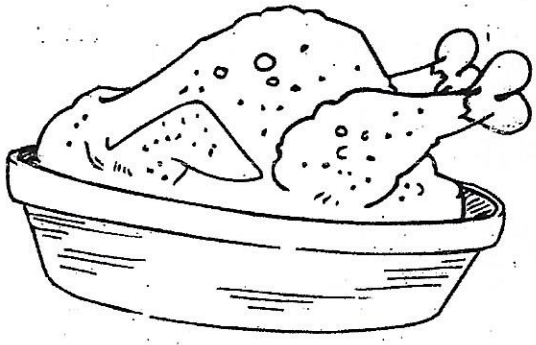
2. $45 \div (-15)$

3. $-28 \div 4$

4. $\frac{0}{-7}$

5. $-16 \div (-8)$

6. $-26 \div (-13)$



Find the value of each expression.

7. $-121 \div (-11)$

8. $\frac{0}{15}$

9. $100 \div (-20)$

10. $\frac{20}{-5}$

11. $-9 \div 3$

12. $\frac{-38}{-19}$

13. $96 \div 16$

14. $\frac{-21}{-7}$

15. Describe a real-life situation in which negative numbers are used. Write your own word problem involving these negative numbers and division.

Name Date

Solving addition and subtraction equations

Integer Exploration

To find a solution to an equation, the equation must be solved. To solve addition and subtraction equations you must isolate the variable. Simply subtract if it is an addition problem and add if it is a subtraction problem to get the given variable by itself. Remember the following two properties of equality:

1. If the same number is subtracted from each side of an equation, the two sides remain equal.

   Solve $r + 12 = 67$
   $r + 12 - 12 = 67 - 12$ Subtract 12 from each side of equation.
   $r = 55$ Solve for r.

2. If the same number is added to each side of an equation, the two sides remain equal.

   Solve $x - 16 = 32$
   $x - 16 + 16 = 32 + 16$ Add 16 to each side of equation.
   $x = 48$ Solve for x.

Note: It is always a good idea to check each solution by putting it back into the original equation and making sure it creates a true sentence.

State the operation to be used to solve each equation.

1. $x + 7 = 12$ **2.** $b - 14 = 51$ **3.** $24 = h + 3$

4. $6 + a = 15$ **5.** $36 = d - 13$ **6.** $21 + y = 15$

Solve each equation and check your solution.

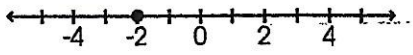
7. $n + 10 = 14$ **8.** $x - 28 = 72$

9. $11 = x - 1$ **10.** $-600 = c - (-400)$

11. $y - 8 = 8$ **12.** $64 + h = 36$

13. $-13 = z + 7$ **14.** $a - 15 = -21$

15. Write an equation whose solution is represented by the number line.



Name

Date

Order of operations

Basics of Algebra

A mathematical expression is any combination of numbers using operation symbols such as +, -, x, and ÷. To evaluate an expression, simply find its numerical value. When an expression contains more than one operation, it is important to use the order of operations when finding its value. The rules for the order of operations are as follows:

1. Multiply and divide from left to right.
2. Then add and subtract from left to right.

Find the value of $3 + 2 \times 10$.

$3 + 2 \times 10$	Multiply.
$3 + 20$	Add.
23	Final answer.

When there are grouping symbols (parentheses or brackets), simplify within the symbols first and then use the order of operations. Example,

Find the value of $2(8 + 6) - 7 \times 3$.

$2(8 + 6) - 7 \times 3$	Add.	
$2(14) - 7 \times 3$	Multiply.	$2(14)$ means 2×14.
$28 - 21$	Subtract.	
7	Final answer.	

Name the operation you would do first.

1. $8 + 6 - 3$

2. $15 \div (7 - 2) - 3$

3. $5 \times 4 \div 10$

4. $24 - 21 \div 3$

Find the value of each expression.

5. $18 - 12 \div 4$

6. $12 - (4 + 7)$

7. $7 \times (3 + 4)$

8. $12 \div 3 \times 2$

9. $(11 + 4) \div 5$

10. $(10 \times 4) \div (2 \times 2)$

11. $30 \div 6 - 1$

12. $42 \div (5 + 2) \times 3$

Insert parentheses so each expression has the given value.

13. $56 \div 7 \times 2; 4$

14. $12 + 8 \div 4; 5$

Name Date

Variables and expressions

Basics of Algebra

An expression that contains a combination of variables, numbers, and at least one operation is called an algebraic expression. A variable is any symbol, such as x, y, or a, that may be replaced with numbers. An algebraic expression can be evaluated by simply replacing the variables in the expression with their assigned values and then finding the numerical value of the expression.

Evaluate each expression if $x = 2$ and $y = 5$.

1. $6x - 2y$ — Notice, $6x$ means 6 times x and $2y$ means 2 times y.
   $6(2) - 2(5)$ — Replace variables with assigned values. Multiply.
   $12 - 10$ — Subtract.
   2 — Final answer.

2. $4x + (5 + 3y) - 13$ — Remember, evaluate within grouping symbols first.
   $4(2) + (5 + 3(5)) - 13$ — Replace variables with assigned values.
   $8 + (5 + 15) - 13$ — Multiply.
   $8 + 20 - 13$ — Simplify by adding within grouping symbols first. Add.
   $28 - 13$ — Subtract.
   15 — Final answer.

Evaluate each expression given the value of its variable.

1. $y + 2;\ y = 4$

2. $\frac{6a}{3};\ a = 3$

3. $\frac{10d}{4} - 8;\ d = 6$

4. $x - 7;\ x = 12$

5. $2c - 4;\ c = 5$

6. $12 - 5z;\ z = 2$

Evaluate each expression if $x = 5$, $y = 2$, and $z = 8$.

7. $2z - 3x$

8. $\frac{6x}{y + z}$

9. $2z - xy$

10. $10x - (4y + z)$

11. $4x - (y + z)$

12. $\frac{7z}{x + y}$

13. $6z + 7y - 3x$

14. $2z + 3x + 4y$

Name

Date

Solving multiplication and division equations

Integer Exploration

To solve multiplication and division equations, simply divide or multiply on each side of the equation to get the given variable by itself. Remember the following two properties of equality:

1. If you divide each side of an equation by the same nonzero number, the two sides remain equal.

   Solve $4x = 84$

   $\frac{4x}{4} = \frac{84}{4}$ Divide each side by 4 to isolate x.

   $x = 21$ Solve for x.

2. If you multiply each side of an equation by the same number, the two sides remain equal.

   Solve $\frac{x}{21} = 2$

   $\frac{x}{21} \times 21 = 2 \times 21$ Multiply each side by 21 to isolate x.

   $x = 42$ Solve for x.

Note: It is always a good idea to check each solution by putting it back into the original equation and making sure it creates a true sentence.

1. Explain in your own words the steps you would use to solve $\frac{x}{5} = -7$.

2. Write two equations of the forms $ax = b$ and $\frac{x}{b} = a$, each with a solution of 3.

Solve each equation using the inverse operation.

3. $9x = 63$

4. $-96b = 96$

5. $\frac{a}{-6} = 2$

6. $4t = -36$

7. $-64 = -16y$

8. $-25x = -125$

9. $\frac{b}{40} = -3$

10. $\frac{r}{15} = 20$

11. Write a word problem that can be solved using the equation $3x = 21$.

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Solving equations with two operations

Integer Exploration

To solve an equation with two operations, work backward and undo each operation one by one. It is important to remember to undo addition and subtraction first, then undo multiplication and division.

Solve $3x + 9 = 21$

$3x + 9 - 9 = 21 - 9$ Subtract 9 from each side of the equation.

$\frac{3x}{3} = \frac{12}{3}$ Divide by 3 on each side to isolate the variable.

$x = 4$ Solve for x.

Check: $3(4) + 9 = 21$

$12 + 9 = 21$

$21 = 21$ It is a true sentence. Thus, the solution is 4.

Solve $\frac{x}{5} - 10 = 2$

$\frac{x}{5} - 10 + 10 = 2 + 10$ Add 10 to each side of equation.

$\frac{x}{5} \cdot 5 = 12 \cdot 5$ Multiply by 5 on each side of equation.

$x = 60$ Solve for x.

Check: $\frac{60}{5} - 10 = 2$

$12 - 10 = 2$

$2 = 2$ It is a true sentence. Thus, the solution is 60.

Note: It is always a good idea to check each solution by putting it back into the original equation and making sure it creates a true sentence.

State the two steps to use to solve each equation.

1. $4x - 8 = 9$
2. $\frac{b+7}{4} = 9$
3. $52 \div \frac{y}{4} = 36$
4. $\frac{a}{2} + 14 = 16$
5. $2x + 12 = 18$
6. $\frac{z}{5} - 6 = 14$

Solve each inequality and check the solution.

7. $75 + 4x = 3$
8. $\frac{z-12}{3} = 4$
9. $6 - 3b = 42$
10. $\frac{s}{-6} - 9 = 2$
11. $-9 + 2y = 13$
12. $\frac{a}{5} - 4 = -6$
13. $-7 = -56 + 7t$
14. $-18 = \frac{-9+d}{-3}$

15. Write a two-step equation using the numbers 3, 4, and 5, in which the solution is 2.

Solving One-Step Equations (Multiplication and Division)

$$5x = 15$$
$$\frac{5x}{5} = \frac{15}{5}$$
$$x = 3$$

$$-\frac{2}{3}y = -8$$
$$-\frac{3}{2} \cdot -\frac{2}{3}y = -8 \cdot \frac{3}{2}$$
$$y = 12$$

Solve each equation for the given variable.

1. $6x = -36$
2. $-5x = -20$
3. $-35c = 700$
4. $-12h = 144$
5. $10x = -100$
6. $-30 = 2x$
7. $7x = -84$
8. $4c = 288$
9. $3b = -39$
10. $-(-90) = -45a$
11. $\frac{x}{-8} = \frac{1}{4}$
12. $\frac{4}{x} = \frac{2}{9}$
13. $\frac{-3}{4} = \frac{n}{16}$
14. $\frac{6}{k} = \frac{2}{5}$
15. $-\frac{3}{8} = \frac{x}{24}$
16. $\frac{2}{n} = \frac{1}{9}$
17. $-\frac{x}{6} = \frac{2}{3}$
18. $\frac{x}{6} = \frac{6}{9}$
19. $1.6c = 80$
20. $12.6 = 3b$

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Solving One-Step Equations (Addition and Subtraction)

$$12 + x = -13$$
$$12 + -12 + x = -13 + -12$$
$$x = -25$$

Solve each equation for the given variable.

1. $y - 12 = 15$
2. $x - 13 = -23$
3. $12 + -g = 14$
4. $3 + x = 9$
5. $-13 + x = 18$
6. $-t + -7 = -56$
7. $27 = v + -5$
8. $-19 + b = 31$
9. $a + 5.7 = 18.9$
10. $-100 = b + -73$
11. $-4 = x - 3$
12. $2\frac{1}{3} + r = 4\frac{2}{9}$
13. $x + 2 = 2(3 - 4)$
14. $-13 = n + (-36)$
15. $c - 3 = 4.7$
16. $r = 4.4 + 3.9$
17. $z + 3.5 = 3.7$
18. $s - 9 = (6 + -8)$
19. $n + \frac{1}{2} = \frac{3}{4}$
20. $12 - -u = 19$

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Practice 3.1

Divisibility

Determine whether the first number listed is divisible by the second number.

1. 84 9 _____ **2.** 127 3 _____ **3.** 1,700 5 _____

4. 753 3 _____ **5.** 256 6 _____ **6.** 824 4 _____

7. 5,240 10 _____ **8.** 7,512 6 _____ **9.** 8,905 5 _____

10. 4,026 4 _____ **11.** 5,924 6 _____ **12.** 9,423 9 _____

Complete this table. Place a check mark to show divisibility.

		54	180	912	2,700	5,605
13.	Divisible by 3					
14.	Divisible by 5					
15.	Divisible by 9					

Find the value of the missing digit that will make each resulting number divisible by 7.

16. 3□5 _____ **17.** 1,1□6 _____ **18.** 41,0□5 _____ **19.** 4□9,852 _____

Test Prep

20. The number 5,270 is *not* divisible by which number?

A 10 **C** 3

B 5 **D** 2

21. If Fred has 64 books to give away, could he split them evenly amongst four of his friends? Explain.

_____

_____

_____

_____

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Use with text pages 58–59.