May, 2022

Dear Parents/Guardians,

The attached math enrichment packet is meant to provide your child with a review of material he/she learned in 6th grade. Your child is expected to turn the completed packet into Mrs. Butler (7th grade) on the first day of the 2022-2023 school year. Please encourage your child to schedule time throughout the summer to work on the packet and not wait until the end of summer to begin.

Reminders for your child:

- Read and follow all directions
- Show work (in an organized manner & # each problem) for ANY/ALL problems to receive full credit. You will turn this paper in with the completed packet.

Have a great summer!

Name ______________________ Date ______________ Class ______________

LESSON 1-1

Identifying Integers and Their Opposites

Reteach

Positive numbers are greater than 0. Use a positive number to represent a gain or increase. Include the positive sign (+).

an increase of 10 points	+10
a flower growth of 2 inches	+2
a gain of 15 yards in football	+15

Negative numbers are less than 0. Use a negative number to represent a loss or decrease. Also use a negative number to represent a value below or less than a certain value. Include the negative sign (−).

a bank withdrawal of $30	−30
a decrease of 9 points	−9
2° below zero	−2

−6 −5 −4 −3 −2 −1 0 1 2 3 4 5 6

negative numbers positive numbers

Opposites are the same distance from zero on the number line, but in different directions. −3 and 3 are opposites because each number is 3 units from zero on a number line.

Integers are the set of all whole numbers, zero, and their opposites.

Name a positive or negative number to represent each situation.

1. an increase of 3 points

____

2. spending $10

____

3. earning $25

____

4. a loss of 5 yards

____

Write each integer and its opposite. Then graph them on the number line.

−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 1 2 3 4 5 6 7 8 9 10

5. −1 _______________

6. 9 _______________

7. 6 _______________

8. −5 _______________

Name ____________________ Date ______________ Class ______________

LESSON 1-2

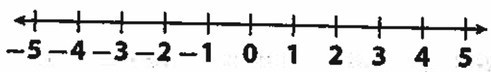
Comparing and Ordering Integers

Reteach

You can use a number line to compare integers.

As you move *right* on a number line, the values of the integers *increase*.
As you move *left* on a number line, the values of the integers *decrease*.

Compare –4 and 2.

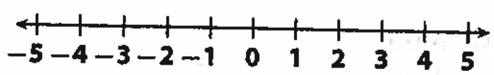


–4 is to the left of 2, so –4 < 2.

Use the number line above to compare the integers. Write < or >.

1. 1 ◯ –4
2. –5 ◯ –2
3. –3 ◯ 2
4. –1 ◯ –4
5. 5 ◯ 0
6. –2 ◯ 3

You can also use a number line to order integers.
Order –3, 4, and –1 from least to greatest.



List the numbers in the order in which they appear from left to right.

The integers in order from least to greatest are –3, –1, 4.

Order the integers from least to greatest.

7. –2, –5, –1 ____________
8. 0, –5, 5 ____________
9. –5, 2, –3 ____________
10. 3, –1, –4 ____________
11. 3, –5, 0 ____________
12. –2, –4, 1 ____________

Name ______________________ Date ______________ Class ______________

LESSON 2-1

Greatest Common Factor

Reteach

The *greatest common factor*, or GCF, is the largest number that is the factor of two or more numbers.

To find the GCF, first write the factors of each number.

Example

Find the GCF of 18 and 24.

Solution Write the factors of 18 and 24. Highlight the *largest* number that is common to both lists of factors.

Factors of 18: 1, 2, 3, **6**, 9, and 18

Factors of 24: 1, 2, 3, 4, **6**, 8, 12, and 24

The GCF of 18 and 24 is 6.

This process works the same way for more than two numbers.

Find the GCF.

1. 32 and 48 ____________
2. 18 and 36 ____________
3. 28, 56, and 84 ____________
4. 30, 45, and 75 ____________

The *distributive principle* can be used with the GCF to rewrite a sum of two or more numbers.

Example

Write 30 + 70 as the product of the GCF of 30 and 70 and a sum.

Solution

Step 1 Find the GCF of 30 and 70.

Factors of 30: 1, 2, 3, 5, 6, **10**, 15, and 30

Factors of 70: 1, 2, 5, 7, **10**, 14, 35, and 70.
The GCF is 10.

Step 2 Write "10 × (? + ?)." To find the questions marks, divide: 30 ÷ 10 = 3; 70 ÷ 10 = 7

Step 3 So, 30 + 70 can be written as 10 × (3 + 7).

Rewrite each sum as a product of the GCF and a new sum.

5. 9 + 15 = ____________
6. 100 + 350 = ____________
7. 12 + 18 + 21 = ____________

Name ____________________ Date ______________ Class ______________

LESSON 2-2

Least Common Multiple

Reteach

The smallest number that is a multiple of two or more numbers is called the least common multiple (LCM) of those numbers.

To find the least common multiple of 3, 6, and 8, list the multiples for each number and put a circle around the LCM in the three lists.

Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24

Multiples of 6: 6, 12, 18, 24, 30, 36, 42

Multiples of 8: 8, 16, 24, 32, 40, 48, 56

So 24 is the LCM of 3, 6, and 8.

List the multiples of each number to help you find the least common multiple of each group.

1. 2 and 9

   Multiples of 2: ______________

   Multiples of 9: ______________

   LCM: ________

2. 4 and 6

   Multiples of 4: ______________

   Multiples of 6: ______________

   LCM: ________

3. 4 and 10

   Multiples of 4: ______________

   Multiples of 10: ______________

   LCM: ________

4. 2, 5, and 6

   Multiples of 2: ______________

   Multiples of 5: ______________

   Multiples of 6: ______________

   LCM: ________

5. 3, 4, and 9

   Multiples of 3: ______________

   Multiples of 4: ______________

   Multiples of 9: ______________

   LCM: ________

6. 8, 10, and 12

   Multiples of 8: ______________

   Multiples of 10: ______________

   Multiples of 12: ______________

   LCM: ________

7. Pads of paper come 4 to a box, pencils come 27 to a box, and erasers come 12 to a box. What is the least number of kits that can be made with paper, pencils, and erasers with no supplies left over?

   ____

Name ______________________ Date ____________ Class ____________

LESSON 3-3

Comparing and Ordering Rational Numbers

Reteach

You can write decimals as fractions or mixed numbers. A place value table will help you read the decimal. Remember the decimal point is read as the word "and."

To write 0.47 as a fraction, first think about the decimal in words.

Ones	Tenths	Hundredths	Thousandths	Ten Thousandths
0 .	4	7		

0.47 is read "forty-seven hundredths." The place value of the decimal tells you the denominator is 100.

$$0.47 = \frac{47}{100}$$

To write 8.3 as a mixed number, first think about the decimal in words.

Ones	Tenths	Hundredths	Thousandths	Ten Thousandths
8 .	3			

8.3 is read "eight and three tenths." The place value of the decimal tells you the denominator is 10. The decimal point is read as the word "and."

$$8.3 = 8\frac{3}{10}$$

Write each decimal as a fraction or mixed number.

1. 0.61 ____
2. 3.43 ____
3. 0.009 ____
4. 4.7 ____
5. 1.5 ____
6. 0.13 ____
7. 5.002 ____
8. 0.021 ____

Name ______________________ Date ______________ Class______________

LESSON 4-1

Applying GCF and LCM to Fraction Operations

Reteach

How to Multiply a Fraction by a Fraction

$\frac{2}{3} \cdot \frac{3}{8}$

$\frac{2}{3} \cdot \frac{3}{8} = \frac{6}{}$ Multiply numerators.

$\frac{2}{3} \cdot \frac{3}{8} = \frac{6}{24}$ Multiply denominators.

$\frac{6 \div 6}{24 \div 6} = \frac{1}{4}$ Divide by the greatest common factor (GCF).

The GCF of 6 and 24 is 6.

How to Add or Subtract Fractions

$\frac{5}{6} + \frac{11}{15}$

$\frac{25}{30} + \frac{22}{30}$ Rewrite over the least common multiple (LCM).

The least common multiple of 6 and 15 is 30.

$\frac{25}{30} + \frac{22}{30} = \frac{47}{30}$ Add the numerators.

$= 1\frac{17}{30}$ If the sum is an improper fraction, rewrite it as a mixed number.

Multiply. Use the greatest common factor.

1. $\frac{3}{4} \cdot \frac{7}{9}$ ________________

2. $\frac{2}{7} \cdot \frac{7}{9}$ ________________

3. $\frac{7}{11} \cdot \frac{22}{28}$ ________________

4. $8 \cdot \frac{3}{10}$ ________________

5. $\frac{4}{9} \cdot \frac{3}{4}$ ________________

6. $\frac{3}{7} \cdot \frac{2}{3}$ ________________

Add or subtract. Use the least common multiple.

7. $\frac{7}{9} + \frac{5}{12}$ ________________

8. $\frac{21}{24} - \frac{3}{8}$ ________________

9. $\frac{11}{15} + \frac{7}{12}$ ________________

Name ____________________ Date ____________ Class ____________

LESSON 4-2

Dividing Fractions

Reteach

Two numbers are reciprocals if their product is 1.

$\frac{2}{3}$ and $\frac{3}{2}$ are reciprocals because $\frac{2}{3} \cdot \frac{3}{2} = \frac{6}{6} = 1$.

Dividing by a number is the same as multiplying by its reciprocal.

$$\frac{1}{4} \div \frac{1}{2} = \frac{1}{2} \longrightarrow \frac{1}{4} \cdot \frac{2}{1} = \frac{1}{2}$$

So, you can use reciprocals to divide by fractions.

Find $\frac{2}{3} \div \frac{1}{4}$.

First, rewrite the expression as a multiplication expression.

Use the reciprocal of the divisor: $\frac{1}{4} \cdot \frac{4}{1} = 1$.

$$\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \cdot \frac{4}{1}$$
$$= \frac{8}{3}$$
$$= 2\frac{2}{3}$$

Think: 6 thirds is 2, and 2 of the 8 thirds are left over.

Rewrite each division expression as a multiplication expression. Then find the value of the expression. Write each answer in simplest form.

1. $\frac{1}{4} \div \frac{1}{3}$ ____________
2. $\frac{1}{2} \div \frac{1}{4}$ ____________
3. $\frac{3}{8} \div \frac{1}{2}$ ____________
4. $\frac{1}{3} \div \frac{3}{4}$ ____________

Divide. Write each answer in simplest form.

5. $\frac{1}{5} \div \frac{1}{2}$ ____________
6. $\frac{1}{6} \div \frac{2}{3}$ ____________
7. $\frac{1}{8} \div \frac{2}{5}$ ____________
8. $\frac{1}{8} \div \frac{1}{2}$ ____________

Name ______________________ Date ______________ Class ______________

LESSON 5-2

Adding and Subtracting Decimals

Reteach

You can use a place-value chart to help you add and subtract decimals.

Add 1.4 and 0.9.

	Tens	Ones	Tenths	Hundredths	Thousandths
		1.	4		
+		0.	9		

So, 1.4 + 0.9 = 2.3.

Subtract 2.4 from 3.1.

	Tens	Ones	Tenths	Hundredths	Thousandths
		3.	1		
−		2.	4		

So, 3.1 − 2.4 = 0.7.

Find each sum or difference.

1.

	Tens	Ones	Tenths	Hundredths	Thousandths
		2.	6		
+		1.	1	5	

____

2.

	Tens	Ones	Tenths	Hundredths	Thousandths
		2.	5	3	
−		1.	7		

____

3. 4.3 + 1.4

	Tens	Ones	Tenths	Hundredths	Thousandths
+					

____

4. 14.4 − 3.8

	Tens	Ones	Tenths	Hundredths	Thousandths
−					

____

5. 7.3 + 8.5

	Tens	Ones	Tenths	Hundredths	Thousandths
+					

____

6. 12.34 − 6.9

	Tens	Ones	Tenths	Hundredths	Thousandths
−					

____

Estimate the answers to Exercises 3–6 by rounding to the nearest whole number. Compare your estimate to the exact answers.

7. 4.3 + 1.4

____

____

8. 14.4 − 3.8

____

____

9. 7.3 + 8.5

____

____

10. 12.34 − 6.9

____

____

Name ______________________ Date ______________ Class ______________

LESSON 5-3

Multiplying Decimals

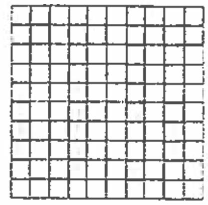
Reteach

You can use a model to help you multiply a decimal by a whole number.

Find the product of 0.12 and 4.

Use a 10-by-10 grid. Shade 4 groups of 12 squares.

Count the number of shaded squares. Since you have shaded 48 of the 100 squares, 0.12 × 4 = 0.48.



Find each product.

1. 0.23 × 3 ______________
2. 0.41 × 2 ______________
3. 0.01 × 5 ______________
4. 0.32 × 2 ______________
5. 0.15 × 3 ______________
6. 0.42 × 2 ______________
7. 0.04 × 8 ______________
8. 0.22 × 4 ______________

You can also use a model to help you multiply a decimal by a decimal.

Find the product of 0.8 and 0.4.

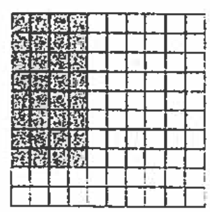
Step 1 Shade 8 tenths of the figure.

Step 2 Shade darker 4 tenths of the shaded area.

Step 3 How many squares have you shaded twice?

You have twice shaded 32 of the squares.

So, 0.8 × 0.4 = 0.32.



Find each product.

9. 0.2 × 0.8 ______________
10. 0.7 × 0.9 ______________
11. 0.5 × 0.5 ______________
12. 0.3 × 0.6 ______________
13. 0.5 × 0.2 ______________
14. 0.4 × 0.4 ______________
15. 0.1 × 0.9 ______________
16. 0.4 × 0.7 ______________

Name ______________________ Date ____________ Class ____________

LESSON 6-2

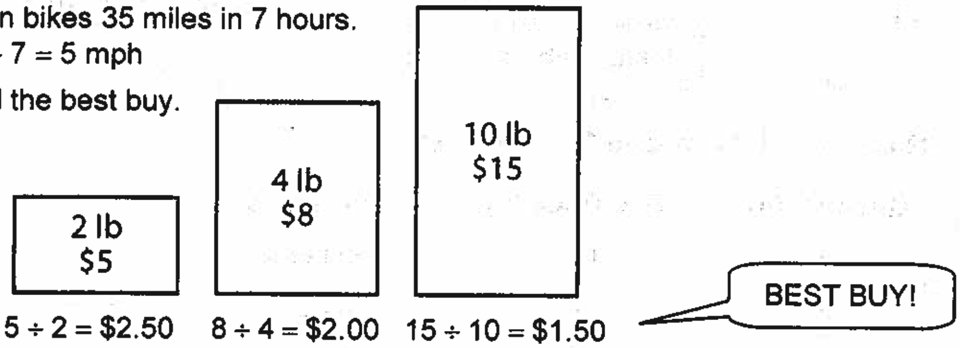
Rates

Reteach

You can divide to find a unit rate or to determine a best buy.

A. Find the unit rate.
Karin bikes 35 miles in 7 hours.
$35 \div 7 = 5$ mph

B. Find the best buy.



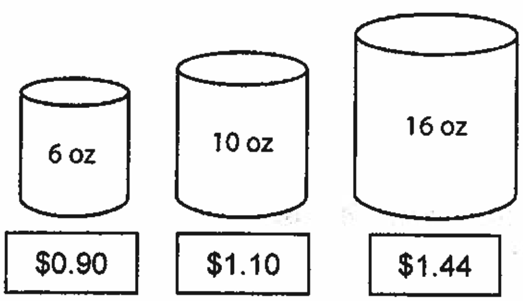
$5 \div 2 = \$2.50$ per lb $8 \div 4 = \$2.00$ per lb $15 \div 10 = \$1.50$ per lb

Divide to find each unit rate. Show your work.

1. Jack shells 315 peanuts in 15 minutes. ____________
2. Sharmila received 81 texts in 9 minutes. ____________
3. Karim read 56 pages in 2 hours. ____________

Find the best buy. Show your work.

4.



____

____

5.

Bread	Weight (oz)	Cost ($)
Whole wheat	16	2.24
Pita	20	3.60
7-grain	16	2.56

____

____

____

____

Name ______________________ Date ______________ Class ______________

LESSON 7-1

Ratios, Rates, Tables, and Graphs

Reteach

A **ratio** shows a relationship between two quantities.

Ratios are **equivalent** if they can be written as the same fraction in lowest terms.

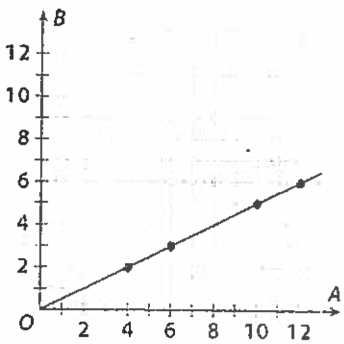
A **rate** is a ratio that shows the relationship between two different units of measure in lowest terms.

You can make a table of equivalent ratios. You can graph the equivalent ratios.

A	4	6	10	12
B	2	3	5	6

$\frac{4}{2} = \frac{2}{1}$ $\frac{6}{3} = \frac{2}{1}$

$\frac{10}{5} = \frac{2}{1}$ $\frac{12}{6} = \frac{2}{1}$



1. Use equivalent ratios to complete the table.

A	6	9			18		
B	2		4	5		7	8

2. Show the ratios are equivalent by simplifying any 4 of them.

____

3. Find the rate of $\frac{A}{B}$ and complete the equivalent ratio: $\frac{69}{\_\_\_}$.

____

4. Use the rate to find how many As are needed for 63 Bs, then write the ratio.

____

Name ______________________ Date ______________ Class ______________

LESSON 7-2

Solving Problems with Proportions

Reteach

You can solve problems with proportions in two ways.

A. Use equivalent ratios.

Hanna can wrap 3 boxes in 15 minutes.
How many boxes can she wrap in 45 minutes?

$$\frac{3}{15} = \frac{}{45}$$

$3 \times 3 = ?$
$15 \times \mathbf{3} = 45$

$$\frac{3 \bullet 3}{15 \bullet 3} = \frac{9}{45}$$

Hanna can wrap 9 boxes in 45 minutes.

B. Use unit rates.

Dan can cycle 7 miles in 28 minutes.
How long will it take him to cycle 9 miles?

$$\frac{28 \text{ min}}{7 \text{mi}} = \frac{}{1 \text{ mi}}$$

Divide by 7.

$\frac{28}{7} = \frac{28 \div 7}{1} = \frac{4}{1}$, or 4 minutes per mile

To cycle 9 miles, it will take Dan 9×4, or 36 minutes.

Solve each proportion. Use equivalent ratios or unit rates. Round to the nearest hundredth if needed.

1. Twelve eggs cost $2.04. How much would 18 eggs cost?

   ____

2. Seven pounds of grapes cost $10.43. How much would 3 pounds cost? ______________________

3. Roberto wants to reduce a drawing that is 12 inches long by 9 inches wide. If his new drawing is 8 inches long, how wide will it be?

   ____

Name ______________________ Date ______________ Class______________

LESSON 8-1

Understanding Percent

Reteach

A. A percent is a ratio of a number to 100. Percent means "per hundred."
To write 38% as a fraction, write a fraction with a denominator of 100.

$$\frac{38}{100}$$

Then write the fraction in simplest form.

$$\frac{38}{100} = \frac{38 \div 2}{100 \div 2} = \frac{19}{50}$$

So, 38% = $\frac{19}{50}$.

B. To write 38% as a decimal, first write it as fraction.

$$38\% = \frac{38}{100}$$

$\frac{38}{100}$ means "38 divided by 100."

```
     0.38
100)38.00
   -300
     800
    -800
       0
```

So, 38% = 0.38.

Write each percent as a fraction in simplest form.

1. 43% ______

2. 72% ______

3. 88% ______

4. 35% ______

Write each percent as a decimal.

5. 64% ______

6. 92% ______

7. 73% ______

8. 33% ______

Name ______________________ Date ______________ Class ______________

LESSON 8-2

Percents, Fractions, and Decimals

Reteach

To change a decimal to a percent:

- move the decimal point two places to the right;
- write the % symbol after the number.

0.07 = .07. = 7%

Write each decimal as a percent.

1. 0.34 ________
2. 0.06 ________
3. 0.93 ________
4. 0.57 ________
5. 0.8 ________
6. 0.734 ________
7. 0.082 ________
8. 0.225 ________
9. 0.604 ________
10. 0.09 ________
11. 0.518 ________
12. 1.03 ________

To change a fraction to a percent:

- Find an equivalent fraction with a denominator of 100.
- Use the numerator of the equivalent fraction as the percent.

$$\frac{8}{25} = \frac{x}{100}$$

$$\frac{8 \cdot 4}{25 \cdot 4} = \frac{32}{100}$$

$$\frac{8}{25} = \frac{32}{100} = 32\%$$

Think: 100 ÷ 25 = 4. So, multiply the numerator and denominator by 4.

Write each fraction as a percent.

13. $\frac{3}{10}$ ________
14. $\frac{2}{50}$ ________
15. $\frac{7}{20}$ ________
16. $\frac{1}{5}$ ________
17. $\frac{1}{8}$ ________
18. $\frac{3}{25}$ ________
19. $\frac{3}{4}$ ________
20. $\frac{23}{50}$ ________
21. $\frac{11}{20}$ ________
22. $\frac{43}{50}$ ________
23. $\frac{24}{25}$ ________
24. $\frac{7}{8}$ ________

Name ______________________ Date ____________ Class ____________

LESSON 9-3

Order of Operations

Reteach

A mathematical phrase that includes only numbers and operations is called a *numerical expression.*

$9 + 8 \times 3 \div 6$ is a numerical expression.

When you evaluate a numerical expression, you find its value.

You can use the order of operations to evaluate a numerical expression.

<u>Order of operations:</u>

1. Do all operations within *parentheses.*
2. Find the values of numbers with *exponents.*
3. *Multiply* and *divide* in order from left to right.
4. *Add* and *subtract* in order from left to right.

Evaluate the expression.

$60 \div (7 + 3) + 3^2$

$60 \div 10 + 3^2$	Do all operations within parentheses.
$60 \div 10 + 9$	Find the values of numbers with exponents.
$6 + 9$	Multiply and divide in order from left to right.
15	Add and subtract in order from left to right.

Simplify each numerical expression.

1. $7 \times (12 + 8) - 6$

   7 × __________ − 6

   __________ − 6

   ____

2. $10 \times (12 + 34) + 3$

   10 × __________ + 3

   __________ + 3

   ____

3. $10 + (6 \times 5) - 7$

   10 + __________ − 7

   __________ − 7

   ____

4. $2^3 + (10 - 4)$

   ____

5. $7 + 3 \times (8 + 5)$

   ____

6. $36 \div 4 + 11 \times 8$

   ____

7. $5^2 - (2 \times 8) + 9$

   ____

8. $3 \times (12 \div 4) - 2^2$

   ____

9. $(3^3 + 10) - 2$

   ____

Solve.

10. Write and evaluate your own numerical expression. Use parentheses, exponents, and at least two operations.

    ____

Name ______________________ Date ______________ Class ______________

LESSON 10-3

Generating Equivalent Expressions

Reteach

Look at the following expressions: $x = 1x$

$x + x = 2x$

$x + x + x = 3x$

The numbers 1, 2, and 3 are called **coefficients** of x.

Identify each coefficient.

1. $8x$ ____ 2. $3m$ ____ 3. y ____ 4. $14t$ ____

An algebraic expression has terms that are separated by + and –.
In the expression $2x + 5y$, the **terms** are $2x$ and $5y$.

Expression	Terms
$8x + 4y$	$8x$ and $4y$
$5m - 2m + 9$	$5m$, $-2m$, and 9
$4a^2 - 2b + c - 2a^2$	$4a^2$, $-2b$, c, and $-2a^2$

Sometimes the terms of an expression can be combined.
Only **like terms** can be combined.

$2x + 2y$ NOT like terms, the variables are different.

$4a^2 - 2a$ NOT like terms, the exponents are different.

$5m - 2m$ Like terms, the variables and exponents are both the same.

$n^3 + 2n^3$ Like terms, the variables and exponents are both the same.

To **simplify** an expression, combine like terms by adding or subtracting the coefficients of the variable.

$\mathbf{5m - 2m = 3m}$

$4a^2 + \mathbf{5a} + \mathbf{a} + 3 = 4a^2 + \mathbf{6a} + 3$ Note that the coefficient of a is 1.

Simplify.

5. $8x + 2x$ ____________
6. $3m - m$ ____________
7. $6y + 6y$ ____________
8. $14t - 3t$ ____________
9. $3b + b + 6$ ____________
10. $9a - 3a + 4$ ____________
11. $n + 5n - 3c$ ____________
12. $12d - 2d + e$ ____________

LESSON 11-2

Addition and Subtraction Equations

Reteach

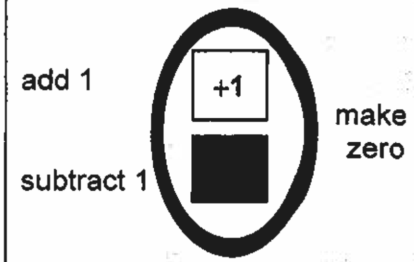
To solve an equation, you need to get the variable alone on one side of the equal sign.

You can use tiles to help you solve subtraction equations.

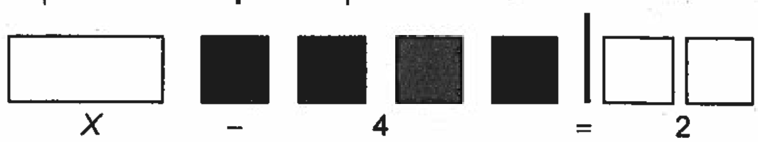
Addition undoes subtraction, so you can use addition to solve subtraction equations.

One positive tile and one negative tile make a **zero pair**.

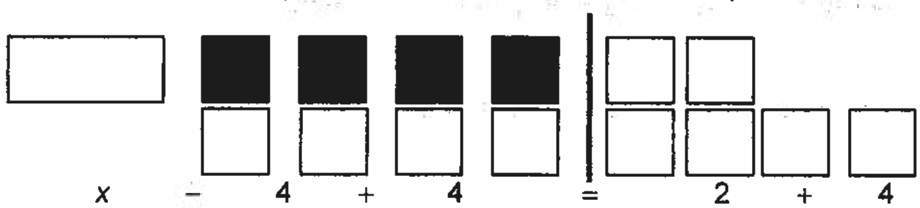
Zero pair: $+1 + (-1) = 0$



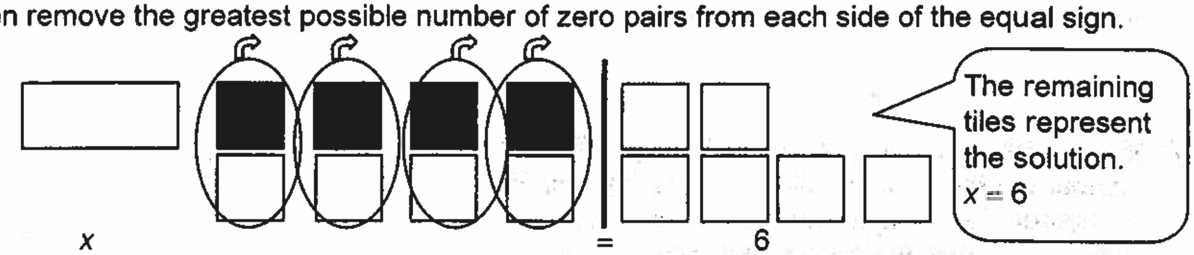
To solve $x - 4 = 2$, first use tiles to model the equation.



To get the variable alone, you have to add positive tiles. Remember to add the same number of positive tiles to each side of the equation.



Then remove the greatest possible number of zero pairs from each side of the equal sign.



Use tiles to solve each equation.

1. $x - 5 = 3$

   $x =$ ____

2. $x - 2 = 7$

   $x =$ ____

3. $x - 1 = 4$

   $x =$ ____

4. $x - 8 = 1$

   $x =$ ____

5. $x - 3 = 3$

   $x =$ ____

6. $x - 6 = 2$

   $x =$ ____

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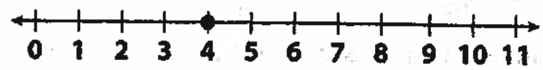
LESSON 11-3

Multiplication and Division Equations

Practice and Problem Solving: D

Solve each equation. Graph the solution on the number line. Check your work. The first is done for you.

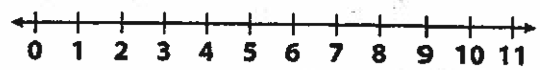
1. $8 = 2m$ $\quad m = \underline{4}$



$\frac{8}{2} = \frac{2m}{2}$

$4 = m \qquad 8 = 2 \bullet 4$✓

2. $\frac{a}{4} = 2$ $\quad a =$ ____



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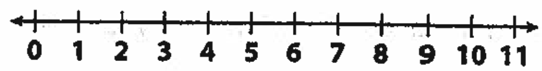
3. $12 = 3s$ $\quad s =$ ____



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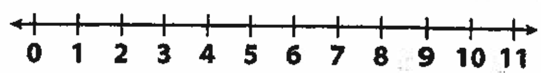
4. $\frac{u}{2} = 5$ $\quad u =$ ____



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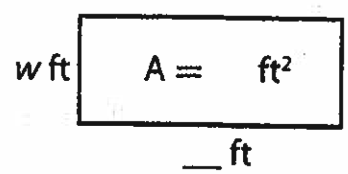
____

Use the situation below to complete Exercises 5–8. The first one is done for you.

Jim knows the length of his garden is 12 feet. He knows the area of the garden is 60 ft^2. What is the width of Jim's garden?

5. Fill in the known values in the picture at the right.
6. Write an equation you can use to solve the problem.



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7. Solve the equation. $w =$ ____
8. Write the solution to the problem.

____

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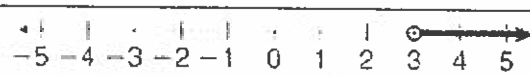
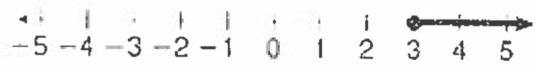
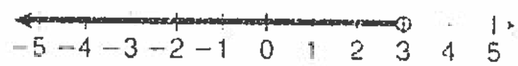
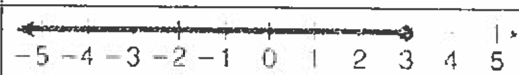
LESSON 11-4

Writing Inequalities

Reteach

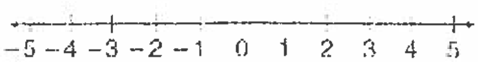
An equation is a statement that says two quantities are equal. An **inequality** is a statement that says two quantities are **not** equal.

A **solution of an inequality** that contains a variable is any value or values of the variable that makes the inequality true. All values that make the inequality true can be shown on a graph.

Inequality	Meaning	Solution of Inequality
$x > 3$	All numbers *greater than* 3	 The *open circle* at 3 shows that the value 3 is **not** included in the solution.
$x \geq 3$	All numbers *greater than or equal to* 3	 The *closed circle* at 3 shows that the value 3 is included in the solution.
$x < 3$	All numbers *less than* 3	
$x \leq 3$	All numbers *less than or equal to* 3	

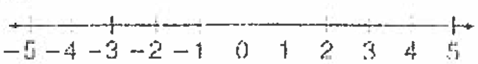
Graph the solutions of each inequality.

1. $x > -4$
   - Draw an open circle at −4.
   - Read $x > -4$ as "x is greater than −4."
   - Draw an arrow to the right of −4.



2. $x \leq 1$
   - Draw a closed circle at 1.
   - Read $x \leq 1$ as "x is less than or equal to 1."
   - Draw an arrow to the left of 1.

3. $a > -1$



4. $y \leq 3$

Write an inequality that represents each phrase.

5. the sum of 2 and 3 is less than y

____

6. the sum of y and 2 is greater than or equal to 6

____

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LESSON 12-1

Graphing on the Coordinate Plane

Reteach

Each quadrant of the coordinate plane has a unique combination of positive and negative signs for the *x*-coordinates and *y*-coordinates as shown here.

Quadrant	*x*-coordinate	*y*-coordinate
I	+	+
II	–	+
III	–	–
IV	+	–

Use these rules when naming points on the coordinate plane.

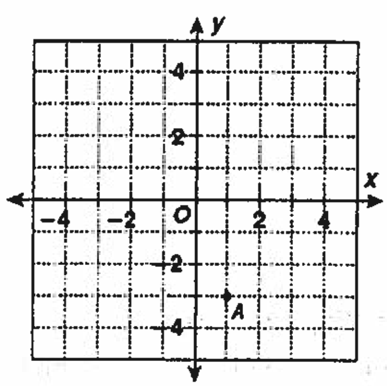
Example 1

Draw the point *A*(1, –3) on the coordinate grid.

Solution

According to the table, this point will be in Quadrant IV.

So, go to the *right* (+) one unit, and go *down* (–) three units.



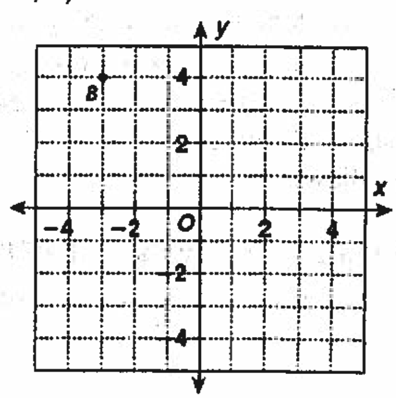
Example 2

What are the coordinates of point *B*?

Solution

According to the table, this point will have a negative *x*-coordinate and a positive *y*-coordinate.

Point *B* is 3 three units to the *left* (–) and four units *up* (+). So the coordinates of point *B* are (–3, 4).



Add the correct sign for each point's coordinates.

1. (____ 3, ____ 4) in Quadrant II

2. (____ 2, ____ 5) in Quadrant IV

3. (____ 9, ____ 1) in Quadrant I

4. In which quadrant is the point (0, 7) located? Explain your answer.

____

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LESSON 12-2

Independent and Dependent Variables in Tables and Graphs

Reteach

In a table, the *independent variable* is often represented by x. The *dependent variable* is often represented by y. Look at this example.

x	0	1	2	3	4	5	6	7
y	4	5	6	7	8	9	10	?

What y value goes for the question mark?

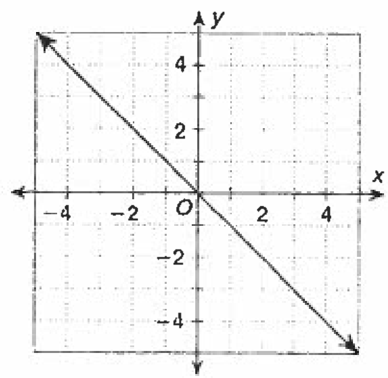
Step 1 Notice that 4 is added to each value of x to give the y value.

Step 2 So, add 4 to 7. What does this give? $4 + 7 = 11$

On a chart or graph,

- the x-axis is usually used for the *independent variable*, and
- the y-axis is usually used for the *dependent variable*.

Look at the example. ⟶



How does y depend on x?

Step 1 Each value of y is the opposite of the value of x.

Step 2 What equation shows this fact?
$y = -x$

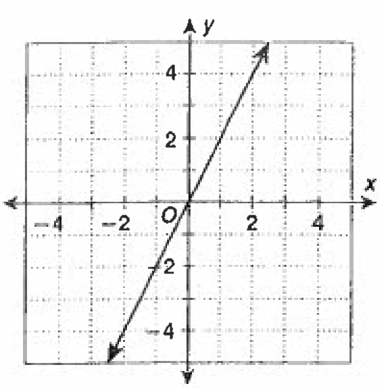
Give the relationship between x and y.

1.

x	1	2	3	4	5
y	3	4	5	6	7

____

2.



a. What is y when $x = 2$?

____

b. What value of x gives $y = -2$?

____

c. Write the equation for the graph.

____

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LESSON 13-1

Area of Quadrilaterals

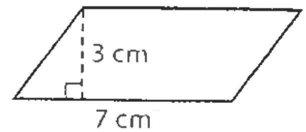
Reteach

You can use formulas to find the areas of quadrilaterals.

The area A of a **parallelogram** is the product of its base b and its height h.

$$A = bh$$

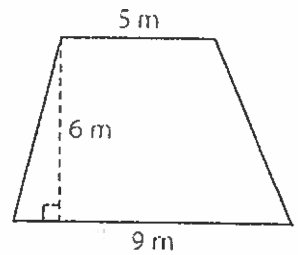
$$A = bh$$
$$= 3 \cdot 7$$
$$= 21 \text{ cm}^2$$



The area of a **trapezoid** is half its height multiplied by the sum of the lengths of its two bases.

$$A = \frac{1}{2}h(b_1 + b_2)$$

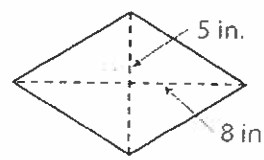
$$A = \frac{1}{2}h(b_1 + b_2)$$
$$= \frac{1}{2} \cdot 6(5 + 9)$$
$$= \frac{1}{2} \cdot 6(14)$$
$$= 3 \cdot 14$$
$$= 42 \text{ m}^2$$



The area of a **rhombus** is half of the product of its two diagonals.

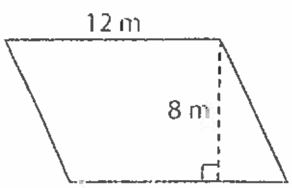
$$A = \frac{1}{2}d_1d_2$$

$$A = \frac{1}{2}d_1d_2$$
$$= \frac{1}{2}(5)(8)$$
$$= 20 \text{ in}^2$$



Find the area of each figure.

1.



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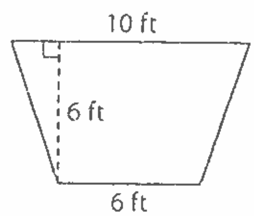
2.



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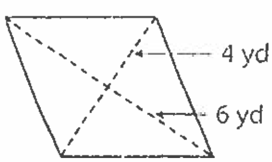
3.



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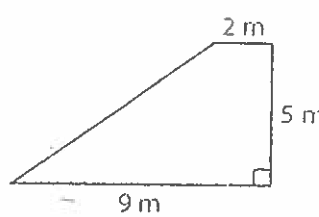

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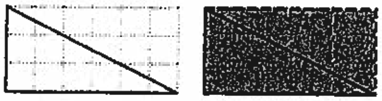
LESSON 13-2

Area of Triangles

Reteach

To find the area of a triangle, first turn your triangle into a rectangle.

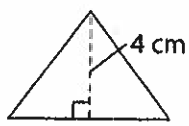


Next, find the area of the rectangle. 6 • 3 = 18 square units

The triangle is half the area of the formed rectangle or $A = \frac{1}{2}bh$, so divide the product by 2.

18 ÷ 2 = 9 So, the area of the triangle is 9 square units.

Find the area of each triangle.

1. 

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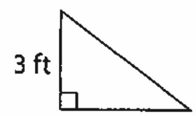
2. 

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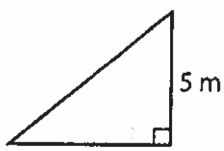
3. 

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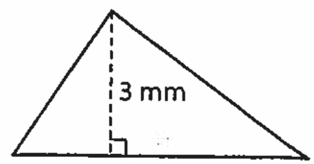
4. 

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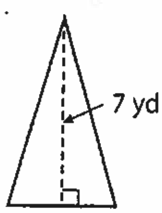
5. 

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6. 

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LESSON 13-4

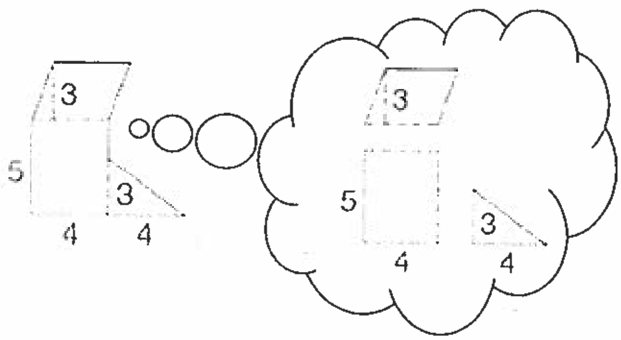
Area of Polygons

Reteach

Sometimes you can use area formulas you know to help you find the area of more complex figures.

You can break a polygon into shapes that you know. Then use those shapes to find the area.

The figure at right is made up of a triangle, a parallelogram, and a rectangle.



Triangle

$A = \frac{1}{2}bh$

$= \frac{1}{2}(3 \times 4)$

$= 6$ square units

Parallelogram

$A = bh$

$= 3 \times 4$

$= 12$ square units

Rectangle

$A = lw$

$= 4 \times 5$

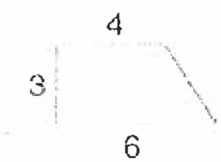
$= 20$ square units

Finally, find the sum of all three areas.

$6 + 12 + 20 = 38$

The area of the whole figure is 38 square units.

Find the area of each figure.

1. 

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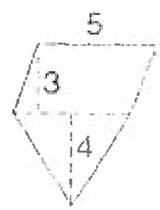
2. 

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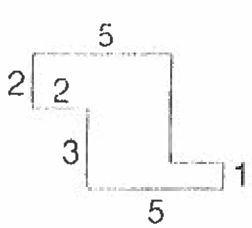
3. 

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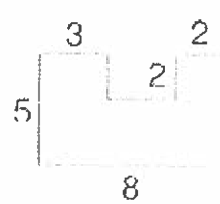
4. 

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