LESSON 1

• Arithmetic with Whole Numbers and Money
• Variables and Evaluation (page 6)

Name ____________________

Teacher Notes:
- Students who have not had Saxon Math Course 1, or who have difficulty with subtraction, multiplication, or division, will benefit from working Targeted Practice 1A, 1B, and 1C *before* Lesson 1.
- Introduce Hint #7, "Column Addition (Sets of Ten)."
- Refer students to "Division" on page 5 and "Number Families" on page 10 in the *Student Reference Guide*.
- Post reference chart, "Number Families."

- **Counting numbers** or **natural numbers** are the numbers we use to count: {1, 2, 3, 4, 5, …)
- **Whole numbers** are the counting numbers and zero: {0, 1, 2, 3, 4, …}
- Money can be written either with a cent sign or with a dollar sign and decimal point, but never both. 50¢ or $0.50
- Four **operations of arithmetic:** addition, subtraction, multiplication, division

Addition:
$$\begin{array}{r} \text{addend} \\ +\ \text{addend} \\ \hline \text{sum} \end{array}$$

Subtraction:
$$\begin{array}{r} \text{minuend} \\ -\ \text{subtrahend} \\ \hline \text{difference} \end{array}$$

Multiplication:
factor × factor = product

Division:
There are three ways to show division.

$$\begin{array}{r} \text{quotient} \\ \textit{divisor}\overline{)\,\textbf{dividend}} \end{array} \qquad \frac{\textbf{dividend}}{\textit{divisor}} = \text{quotient}$$

dividend ÷ *divisor* = quotient

- Letters called **variables** are often used in place of numbers in formulas. The variable can mean any number.

$3 + n = 5$ $\qquad n - 10 = 20$ $\qquad 2 \times n = 12$ $\qquad z - 5 = 2$

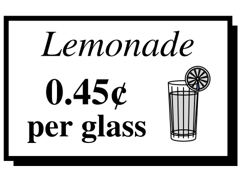
- When variables are assigned a specific number we **evaluate** by calculating.

Evaluate each expression for $x = 10$ and $y = 5$: $\quad x + y \quad\quad xy$

$\qquad 10 + 5 = 15 \qquad 10 \cdot 5 = 50$

Practice Set (page 10)

a. This sign is incorrect. Show two ways to correct the sign.



$0.______ per glass

______¢ per glass

b. Name a whole number that is not a counting number. ______

c. When the **product** of 4 and 4 is **divided** by the **sum** of 4 and 4, what is the quotient? Explain.

(   ) ÷ (   ) = ______
product   *sum*

First, I m____________ and a____________.

Then I d____________ those answers.

Practice Set (continued) (page 10)

d. $1.75
.
.

e. ~~$2.00~~
− .
.

f. $0.65

g. 250
24

h. *short division*
.
)$2 4. 0 0

i. *long division*
)234

Evaluate each expression for $a = 20$ and $b = 4$.

j. $a + b =$ ______ **k.** $a - b =$ ______ **l.** $ab =$ ______ **m.** $\frac{a}{b} =$ ______

Write equations using the number 15, where 15 is:

n. an addend
\+ 5

o. the product
× 5

p. the quotient
5)

q. the subtrahend
−
5

r. the dividend
5
)

s. the minuend
− 5

Written Practice (page 11)

1. ( ) − ( ) =
product *sum*

______

2. M
− 9

______

3. 8
)

______

4. ( ) ÷ ( ) =
product *sum*

First, I m______ and a______.

Then I d______ those answers.

______

5. A______
S______
M______
D______

Use work area.

6. Evaluate each expression for $n = 12$ and $m = 4$.

a. $n + m =$

b. $n - m =$

c. $nm =$

d. $\frac{n}{m} =$

a. ______ **b.** ______

c. ______ **d.** ______

7.
$$\begin{array}{r} \$43.74 \\ - \ \$16.59 \\ \hline \end{array}$$

______

8.
$$\begin{array}{r} 64 \\ \times \ 37 \\ \hline \end{array}$$

______

9. *Cross off sets of ten.*
$$\begin{array}{r} 7 \\ 8 \\ 4 \\ 6 \\ 9 \\ 3 \\ 5 \\ + \ 7 \\ \hline \end{array}$$

______

10.
$$\begin{array}{r} 364 \\ 52 \\ 867 \\ + \ 9 \\ \hline \end{array}$$

______

11. *Subtract across all the zeros.*
$$\begin{array}{r} \cancel{4}\cancel{0}00 \\ - \ 3625 \\ \hline \end{array}$$

______

12. 316

______

13. *long division*

$\overline{)\$43.60}$

______

14. *offset*
$$\begin{array}{r} 40 \\ \times \quad \\ \hline \end{array}$$

______

15. $8 \cdot 12 \cdot 0 =$

______

16. *long division*

$\overline{)3708}$

______

17. *offset*

365

______

______

18. *long division*

R

$\overline{)767}$

______

19. *offset*

30

______

______

20. $\cancel{\$10}.00$
$-$ ___ . ___

21. $\cancel{40}17$
$-\ 3952$

22. *offset*

$2.50

23. *offset*

$2.50

24. *long division*

)560

25. *short division*

)$1 0. 0 0

26. Another name for counting numbers is

n____________ numbers.

See page 7.

Use work area.

27. 25 cents

$ ______ ______ ¢

28. A____________ counting numbers are whole numbers.

See page 7.

Use work area.

29. The answer to a division problem is the

q____________.

Use work area.

30. m__________ – s__________ = d__________

Use work area.

LESSON 2

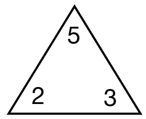
• Properties of Operations
(page 13)

Name ______________________

- **Inverse operations** "undo."

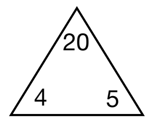
  To undo addition, subtract.

  $2 + 3 = 5 \qquad 5 - 3 = 2$



  To undo multiplication, divide.

  $4 \times 5 = 20 \qquad 20 \div 4 = 5$



- **Commutative Property of addition and multiplication:**

  Changing the order of the addends or factors does *not* change the answer.
  The numbers can commute either way.

  $2 + 3 = 5 \qquad 3 + 2 = 5$
  $4 \times 5 = 20 \qquad 5 \times 4 = 20$

- The commutative property is not true of subtraction or division.

- **Identity Property of addition and multiplication:**

  When a number is added to *zero*, it does not change the number. Zero is the **additive identity**.

  $5 + 0 = 5$

  When a number is multiplied by *one*, it does not change the number. One is the **multiplicative identity**.

  $5 \times 1 = 5$

- **Associative Property of addition and multiplication:**

  How the numbers are grouped does *not* affect the answer.
  They can associate with any number they want to.

  $(2 + 3) + 4 = 2 + (3 + 4) \qquad (2 \times 3) \times 4 = 2 \times (3 \times 4)$

- The associative property is not true of subtraction or division.

- **Property of Zero for multiplication:**

  When any number is multiplied by zero, the product is zero.

  $8 \times 0 = 0$

- In division if the divisor and the dividend both end in zero, you can **cancel matching zeros** to make the problem easier.

  1. Rewrite the problem in fractional form. (This may be only a mental step.)
  2. Cancel matching zeros.
  3. Use short division.
  4. If the answer is written with a remainder, add the zeros back to the remainder.

$$40\overline{)2790}\ \text{R} \longrightarrow \frac{279\cancel{0}}{4\cancel{0}} \longrightarrow \begin{array}{r} 0\,6\,9\ \text{R}\ 3 \\ 4\overline{)2\,7\,{}^{3}9} \end{array} \quad \text{so} \quad \begin{array}{r} 0069\ \text{R}\ 30 \\ 40\overline{)2790} \end{array}$$

Teacher Notes:
- Introduce Hint #8, "Fact Families," and Hint #9, "Long Division: 'Canceling Matching Zeros.'"
- Refer students to "Properties of Operations" on page 19 in the *Student Reference Guide*.
- Triangle Fact Cards are available in the Adaptations Manipulative Kit.

Properties of Operations
Commutative Properties $a + b = b + a$ $a \times b = b \times a$
Associative Properties $(a + b) + c = a + (b + c)$ $(a \times b) \times c = a \times (b \times c)$
Identity Properties $a + 0 = a$ $a \times 1 = a$
Property of Zero for Multiplication $a \times 0 = 0$

Practice Set (page 17)

a. The *additive* identity is z__________. The *multiplicative* identity is o__________.

b. The **inverse** operation of *multiplication* is d__________.

c. Using x, y, and z, an illustration of the *associative property of addition* would be:

(_____ + _____) + _____ = _____ + (_____ + _____)

Now use numbers in place of letters.

(_____ + _____) + _____ = _____ + (_____ + _____)

d. $5 \times ? = 8 \times 5$

To find the missing number in this equation you would use the C__________

P__________ of m__________.

Remember to work within the parentheses first.

e. $(5 + 4) + 3 =$ _____ **f.** $5 + (4 + 3) =$ _____ **g.** $(10 - 5) - 3 =$ _____ **h.** $10 - (5 - 3) =$ _____

i. $(6 \cdot 2) \cdot 5 =$ _____ **j.** $6 \cdot (2 \cdot 5) =$ _____ **k.** $(12 \div 6) \div 2 =$ _____ **l.** $12 \div (6 \div 2) =$ _____

m. List the properties used in each step to simplify the expression $5 \times (14 \times 2)$.

	Steps:	Justification:
	$5 \times (14 \times 2)$	Given expression
Step 1	$5 \times (2 \times 14)$	C__________ P__________ of m__________
Step 2	$(5 \times 2) \times 14$	A__________ P__________ of m__________
Step 3	10×14	M__________ $5 \times$ _____
Step 4	140	M__________ $10 \times$ _____

Written Practice (page 18)

1. ( ) − ( ) =
sum *product*

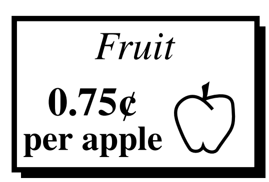
____

2. four cents

____

____

3.



______________ per apple

______________ per apple

4. The inverse of addition is

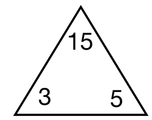
s ____________.

Use work area.

5. ?

)

____

6. 

× =
× =
÷ =
÷ =

Use work area.

7. 5 + (27 + 35)

Steps:	Justification:
5 + (27 + 35)	Given expression
1. (27 + 5) + 35	C__________ P__________ of a__________
2. 27 + (5 + 35)	A__________ P__________ of a__________
3. 27 + 40	Added 5 and 35.
4. 67	Added 27 and 40.

Use work area.

8. *Subtract across all the zeros.*

$~~20.0~~0

− 14.79

____

9. $1.54

× 7

____

10. *short division*

)

____

11. $4.36

.

.

.

.

____

12. $4.89 $~~10.0~~0

\+ . − .

____

13. *Cross off sets of ten.*

8
5
4
6
5
4
3
7
2
4
1
\+ 8

____

14. long division

)3105

____

15. *Cancel matching zeros.*

$\frac{1630}{40} =$

____

16. $81 \div (9 \div 3) =$

17. $(81 \div 9) \div 3 =$

18. *offset*

$3.75

19. 450 / 78 3167

20. 3167 / 450 78

21. *long division*

)$20.00

22. *offset*

70
×

23.

$$\begin{array}{r} 3714 \\ 268 \\ 47 \\ +\ \ 9 \\ \hline \end{array}$$

24. $5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 =$

25. $1.47 ~~$20.00~~

26. *offset* $0.45

27. **a.** $10x = 0$

Property of Z__________ for

m__________

b. $10y = 10$

I__________ Property of m__________

Use work area.

28. Evaluate each expression for $x = 18$ and $y = 3$.

a. $x - y =$ **b.** $xy =$

c. $\frac{x}{y} =$ **d.** $x + y =$

a. __________ **b.** __________

c. __________ **d.** __________

29. Zero is called the a__________ i__________ because when z__________ is added to another n__________, the sum is i__________ to that n__________.

Use work area.

30. d__________ ÷ d__________ = q__________

Use work area.

LESSON
3

• Unknown Numbers in Addition, Subtraction, Multiplication, and Division (page 20)

Name ______________________

Teacher Notes:
- Introduce Hint #10, “Finding Missing Numbers.”
- Refer students to “Missing Numbers” on page 4 in the *Student Reference Guide.*

- **Equation:** A statement that two quantities are equal.

  $3 + 4 = 7 \qquad 5 + a = 9$

- **Variable:** A letter that stands for any unknown number.
- The chart below shows how to solve equations for an unknown number.

Missing Numbers

Operation	Examples	
Addition: To find the missing **addend** ⟶ **subtract**	$\begin{array}{r} 2 \\ +\ A \\ \hline 5 \end{array} \quad \begin{array}{r} 5 \\ -\ 2 \\ \hline A \end{array} = 3$	$\begin{array}{r} B \\ +\ 3 \\ \hline 5 \end{array} \quad \begin{array}{r} 5 \\ -\ 3 \\ \hline B \end{array} = 2$
Subtraction: 1. To find the missing **top** number (minuend) ⟶ **add**	$\begin{array}{r} N \\ -\ 3 \\ \hline 2 \end{array} \quad \begin{array}{r} 3 \\ +\ 2 \\ \hline N \end{array} = 5$	
2. To find the missing **bottom** number (subtrahend) ⟶ **subtract**	$\begin{array}{r} 5 \\ -\ Y \\ \hline 2 \end{array} \quad \begin{array}{r} 5 \\ -\ 2 \\ \hline Y \end{array} = 3$	
Multiplication: To find the missing **factor** ⟶ **divide**	$\begin{array}{r} 3 \\ \times\ N \\ \hline 6 \end{array} \quad \begin{array}{r} N = 2 \\ 3\overline{)6} \end{array}$	$\begin{array}{r} N \\ \times\ 2 \\ \hline 6 \end{array} \quad \begin{array}{r} N = 3 \\ 2\overline{)6} \end{array}$
Division: 1. To find the missing **dividend** ⟶ **multiply**	$\begin{array}{r} 8 \\ 2\overline{)N} \end{array} \quad \begin{array}{r} 8 \\ \times\ 2 \\ \hline N \end{array} = 16$	
2. To find the missing **divisor** ⟶ **divide**	$\begin{array}{r} 2 \\ N\overline{)8} \end{array} \quad \begin{array}{r} N = 4 \\ 2\overline{)8} \end{array}$	

Practice Set (page 23)

a. $\begin{array}{r} a \\ +\ 12 \\ \hline 31 \end{array} =$ ______

b. $\begin{array}{r} b \\ -\ 24 \\ \hline 15 \end{array} =$ ______

c. $\begin{array}{r} c \\ \times\ 15 \\ \hline 180 \end{array} =$ ______

d. $\frac{r}{8} = 12$

$r =$ ______

e. $14e = 420$

$e =$ ______

f. $26 + f = 43$

$f =$ ______

g. $51 - g = 20$

$g =$ ______

h. $\frac{364}{h} = 7$

$h =$ ______

i. $4n = 2 \cdot 12$

$n =$ ______

j. $3 + 6 + m + 12 + 5 = 30$

m = ______

k. $2x =$ ______

Solve: $6 \div 2 =$ ______

Check: $2 \cdot$ ______ $= 6$

1. (   ) ÷ (   ) =
product   *sum*

______

2. Add the s______ and d______ to find the ______.

Use work area.

3. $(a + b) + c = a + (b + c)$

A______ Property of a______

Use work area.

4.
$$\begin{array}{r} 7 \\ +\ m \\ \hline 21 \end{array} \qquad \begin{array}{r} 21 \\ 7 \\ \hline \end{array}$$

______

5. Commutative Property of multiplication

______ · ______ = ______ · ______

Use work area.

6.

Steps:	Justification:
$5 + (x + 7)$	Given expression
$5 + (7 + x)$	**a.** C______ Property
$(5 + 7) + x$	**b.** A______ Property
$12 + x$	$5 + 7 = 12$

Use work area.

7. $x + 83 = 112$

$$\begin{array}{r} 112 \\ 83 \\ \hline \end{array}$$

$x =$ ______

8. $96 - r = 27$

$$\begin{array}{r} 96 \\ 27 \\ \hline \end{array}$$

$r =$ ______

9. $7k = 119$

$k =$ ______

10. $127 + z = 300$

$$\begin{array}{r} 300 \\ 127 \\ \hline \end{array}$$

$z =$ ______

11. $m - 137 = 731$

$$\begin{array}{r} 731 \\ \underline{137} \end{array}$$

$m =$ ______

12. $25n = 400$

$n =$ ______

13. $\frac{625}{w} = 25$

$w =$ ______

14. *offset*

$\frac{x}{60} = 700$ 60

$x =$ ______

15. Evaluate each expression for $a = 20$ and $b = 5$.

a. $\frac{a}{b} =$ **b.** $a - b =$

c. $ab =$ **d.** $a + b =$

a. ______

b. ______

c. ______

d. ______

16. $96 \div (16 \div 2) =$

______

17. $96 \div 16 \div 2 =$

______

18. $1 6.4 7

$+$.

______

19. $50.00 – ($6.48 + $31.75) =

$31.75 ~~$50.00~~

______ . ______ .

______

20.

$$\begin{array}{r} 47 \\ \underline{\times\ 39} \end{array}$$

______

21. *offset*

$8.79

______

22. 1100 − (374 − 87) =

374 1100
87 ______

23. (1100 − 374) − 87 =

1100
374 87

24.
$$\begin{array}{r} 4736 \\ 271 \\ 9 \\ +\quad 88 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 30{,}145 \\ - \qquad \\ \hline \end{array}$$

26. *Cancel matching zeros.*

27. *long division*

$40.00

28. *long division*

$$35\overline{)2104}$$ R

29. *offset*

$0.48

______

30. One is the multiplicative identity because when any number is m__________ by 1, the p__________ is identical to that n__________.

Use work area.

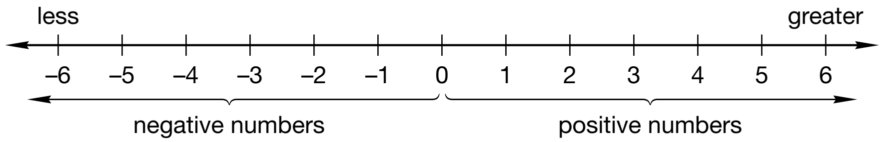
LESSON 4

• Number Line
• Sequences (page 26)

Name ____________________

Teacher Notes:
- Introduce Hint #11, “Positive and Negative Numbers,” Hint #12, “Comparing Numbers,” Hint #13, “Finding Patterns in a Sequence,” and Hint #14, “Abbreviations and Symbols.”
- Refer students to “Number Line” on page 9 in the *Student Reference Guide.*
- A number line is available in the Adaptations Manipulative Kit.

- A **number line** shows numbers arranged in order from smaller to larger numbers.



- The **origin** is the zero point of a number line.

- **Opposites** are numbers the same distance (to the right and left) of the origin (–3, +3).

- **Integers** are all counting numbers (positive and negative) and zero, but not fractions. {…, –3, –2, –1, 0, 1, 2, 3, …}

- **Zero** is neither positive nor negative.

- **Comparison symbols** show equals (=), greater than (>), and less than (<).

$-5 < 4$	$3 + 2 = 5$	$5 > -6$
–5 is less than 4	3 plus 2 equals 5	5 is greater than –6

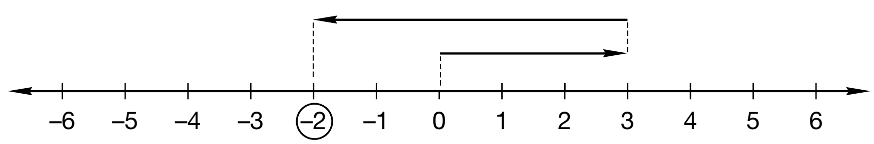
- **Example:** Show this subtraction problem on a number line: 3 – 5

  Always start at the origin.

  Go to the right (+) 3.

  Then, go to the left (–) 5.

  The answer is –2.



$3 - 5 = -2$

- A **sequence** is an ordered list of numbers (terms) that follow a pattern.

- **Arithmetic sequence:** the same number is *added* to each term to make the next term.

- **Geometric sequence:** each term is *multiplied* by the same number to make the next term.

- The pattern for a sequence can be expressed as a **formula.**

- To write the sequence, substitute counting numbers for the variable and write the answers.

  Example: $k = 2n$ Replace n with 1, 2, 3, 4, …

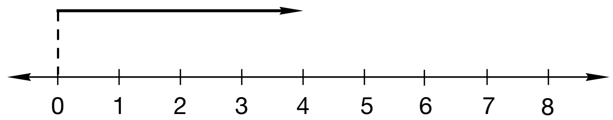
  $k = 2(1) = 2$ $k = 2(2) = 4$ $k = 2(3) = 6$ $k = 2(4) = 8$

  The sequence is 2, 4, 6, 8, …

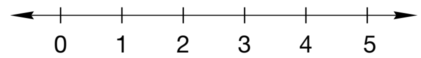
Practice Set (page 31)

For problems **a–c,** use arrows to represent the addition or subtraction. Circle the answer on the number line.

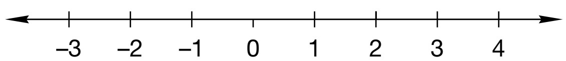
a. 4 + 2



b. 4 − 2



c. 2 − 4



d. Arrange these numbers in order from least to greatest. 0, −1, −2, −3

_____, _____, _____, _____

least greatest

e. Use digits and symbols to write "The sum of 2 and 3 is less than the product of 2 and 3."

(   ) (   )

Write the proper comparison symbol in each circle.

f. 3 − 4   4 − 3

_____ _____

g. 2 · 2   2 + 2

_____ _____

h. What is the first step you take before comparing the expressions in **f** and **g**?

First I must simplify each expression before c__________ them.

i. Where is the **origin** on the number line? _____

j. Simplify: 436 − 630 = _____ *(Be careful!)*

$$\begin{array}{r} 630 \\ \underline{436} \end{array}$$

k. Find the next three numbers of this sequence: …, 3, 2, 1, 0, −1, ... _____, _____, _____

l. Find the next three terms of this sequence: *See times table in the* Student Reference Guide.

1, 4, 9, 16, 25, 36, 49, … _____, _____, _____

m. Describe the rule of this sequence and find the next three terms.

1, 2, 4, 8, … _____, _____, _____ Each term in the sequence can be found by m__________

the preceding t__________ by _____.

n. The rule of a certain sequence is $k = (2n) - 1$. Find the first four terms of the sequence.

_____, _____, _____, _____

Written Practice (page 32)

1. ( ) − ( ) =
product *sum*

______

2.

27	27
s	9
9	

______

3. Numbers greater than zero are called p________ numbers.

Use work area.

4. $n = 6$ $m = 24$

a. $m - n =$ **b.** $n - m =$

c. $\frac{m}{n} =$ **d.** $mn =$

a. ____ **b.** ____ **c.** ____ **d.** ____

5. The product of 5 and 2 is greater than the sum of 5 and 2.

____ ○ ____

6. least to greatest

−2, 1, 0, −1

____, ____, ____, ____

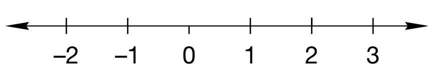
7. $\begin{array}{r} \text{quotient} \\ \text{divisor}\overline{)\text{dividend}} \end{array}$

M________ the divisor and the

q________ to find the dividend.

Use work area.

8. 2 − 3



Use work area.

9. $12x = 12$

$x =$ ______

10. $4 + 8 + \cancel{n} + 6 = 30$
Cross off sets of ten.

$n =$ ______

11. $z - 123 = 654$

$$\begin{array}{r} 654 \\ \underline{123} \end{array}$$

$z =$ ______

12. $1000 - m = 101$

$$\begin{array}{r} 1000 \\ \underline{101} \end{array}$$

$m =$ ______

13. $p + \$1.45 = \$4.95$

$$\begin{array}{r} \$4.95 \\ \underline{1.45} \end{array}$$

$p =$ ______

14. $32k = 224$

$k =$ ______

15. $\frac{r}{8} = 24$

$r =$ ______

16. Steps: | Justification:

$4 + (n + 9) = 20$ Given equation

$4 + (9 + n) = 20$ C________ Property

$(4 + 9) + n = 20$ A________ Property

$13 + n = 20$ $4 + 9 = 13$

$n = 7$ $13 + 7 = 20$

Use work area.

17. **a.** $3 \cdot 4$ ○ $2(6)$

b. -3 ○ -2

c. $3 - 5$ ○ $5 - 3$

d. *Commutative Property* xy ○ yx

a. ____ **b.** ____ **c.** ____ **d.** ____

18. $\$1\cancel{00}.\cancel{00}$ − ____.__

19. 48(36¢) =

20. $5 \cdot 6 \cdot 7 =$

21. *long division*

)9900

22. *offset*

30 40

23. $(130 - 57) + 9 =$

130 − 57 = ____ + 9 = ____

24. $1987 - 2014 =$

Be careful!

2014
− 1987

25. *short division*

)$6 8. 6 0

26. 46¢ + 64¢ =

27. *Cancel matching zeros.*

28. *offset*

$3.75

29. 2, 3, 6

(×) × = × (×)

Use work area.

30. 1, 10, 100, ____, ____

Each term in the s________ can be found by m________ the preceding term by ________.

Use work area.

LESSON 5

• Place Value Through Hundred Trillions
• Reading and Writing Whole Numbers (page 34)

Name ____________________

Teacher Notes:
- Introduce Hint #15, "Place Value (Digit Lines)."
- Refer students to "Spelling Numbers" on page 9 and "Place Value" on page 11 in the *Student Reference Guide.*

- The value of a digit is determined by its **place** within a number.

Whole Number Place Values

hundred trillions	ten trillions	trillions		hundred billions	ten billions	billions		hundred millions	ten millions	millions		hundred thousands	ten thousands	thousands		hundreds	tens	ones	decimal point
___	___	___	,	___	___	___	,	___	___	___	,	___	___	___	,	___	___	___	.

- To change from standard numbers to **expanded notation,** name the **place value** of each digit:

  $3265 = (3 \times 1000) + (2 \times 100) + (5 \times 10) + (6 \times 1)$

- To change from expanded notation to standard numbers:

  1. Count the places in the first parentheses: $(4 \times 1000) + (6 \times 10) + (2 \times 1)$

  2. Draw digit lines for each place: ___, ___ ___ ___

  3. Fill in the digit lines: 4, 0 6 2

- To write numbers using digits:

  Put a **comma** after: trillions, billions, millions, and thousands.

  ___ ___ ___ , ___ ___ ___ , ___ ___ ___ , ___ ___ ___ , ___ ___ ___

  trillions billions millions thousands units

  Always put **three digits** after a comma.

  Use digit lines to help.

- To write numbers using words:

  Put a **comma** after: trillions, billions, millions, and thousands.

  Use a hyphen for all numbers between 20 and 100 that do not end in zero.

Practice Set (page 38)

a. ten-billions place

217,534,896,000,000 ______

b. 9,876,543,210,000

↑ ____________ place

c. 2500 (×) + (5 ×)

Use words to write each number:

d. 36427580 Hint: *First put in commas.* ______________________________

____

Practice Set (continued) (page 38)

e. 40302010 Hint: *First put in commas.* ____________________ million, ____________________

____

f. How do we know where to place commas when writing the numbers in **d** and **e** as words?

Commas separate periods in a n__________. In **d** and **e** place a comma after t__________

and m__________.

Use digits to write each number:

g. twenty-five million, two hundred six thousand, forty

___ ___, ___ ___ ___, ___ ___ ___

h. fifty billion, four hundred two million, one hundred thousand

___ ___, ___ ___ ___, ___ ___ ___, ___ ___ ___

i. $15 billion $ ___ ___, ___ ___ ___, ___ ___ ___, ___ ___ ___

j. $15 m__________

Written Practice (page 38)

1. ___ ___ ___

___ ___ ___ ___

____

2. One hundred one thousand is greater than one thousand, one hundred.

___ ___ ___, ___ ___ ___ ◯ ___, ___ ___ ___

Use work area.

3. 50,574,006

words: ______________________________

____

____

Use work area.

4. trillions place
12,345,678,900,000

____

5. two hundred fifty million, five thousand, seventy

___ ___ ___, ___ ___ ___, ___ ___ ___

6. −12 ◯ −15

words: ______________________________

____

____

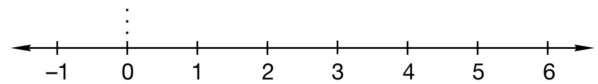
Use work area.

7. least to greatest

−1, 4, −7, 0, 5, 7

___, ___, ___, ___, ___, ___

8. 5 − 4



Use work area.

9. $k = 3n$

3, ___, ___, ___

10. $2 \cdot 3 \cdot 5 \cdot n = 960$

$n =$ ______

11. $a - 1367 = 2500$

$$\begin{array}{r} 2500 \\ \underline{1367} \end{array}$$

$a =$ ______

12. $b + 5 + 17 = 50$

$b =$ ______

13. $\$25.00 - k = \$18.70$

$$\begin{array}{r} \$25.00 \\ \underline{18.70} \end{array}$$

$k =$ ______

14. $6400 + d = 10{,}000$

$$\begin{array}{r} 10{,}000 \\ \underline{6400} \end{array}$$

$d =$ ______

15. $\frac{144}{f} = 8$

$f =$ ______

16. expanded notation

750,000

(×) + (×)

17.

$$\begin{array}{r} 37{,}428 \\ \underline{+\ 59{,}775} \end{array}$$

______

18.

$$\begin{array}{r} 31{,}014 \\ \underline{-\ 24{,}767} \end{array}$$

______

19.

$$\begin{array}{r} 4319 \\ 362 \\ 45 \\ \underline{+\quad 7} \end{array}$$

______

20.

$$\begin{array}{r} \$64.59 \\ . \\ . \\ \underline{.} \end{array}$$

______

21. $144 \div (12 \div 3) =$

______

22. $(144 \div 12) \div 3 =$

______

23. *offset*

$40(500) =$

______

24. *long division*

$8505 \div 21 =$

______

25. $10 – ($4.60 – 39¢) =

$4.60 ____.____

$10.00 ____.____

______

26. 29¢ × 36 =

______

27. **a.** $365n = 365$

______ Property of ______

b. $52 \cdot 7 = 7m$

______ Property of ______

Use work area.

28. …, 10, 8, 6, 4, 2, …

______, ______, ______

Each term in the sequence can be found by

s______ ______ from the

preceding t______.

Use work area.

29. *See the* Student Reference Guide.

a. {1, 2, 3, 4,…}

b. {0, 1, 2, 3,…}

c. {…, –2, –1, 0, 1, 2,…}

a. c______ numbers

b. w______ numbers

c. i______

30. Use: negative even numbers
braces { }
an ellipsis …
digits

, ______, –4, –2

Use work area.

LESSON 6

• Factors
• Divisibility (page 40)

Name ____________________

- A **factor** is a whole number that divides into another whole number evenly.
- To list the factors of whole numbers:
  1. Always *start* with the number 1.
  2. Always *end* with the number given.
  3. Then find all the factors of the number. (Use the times table in the *Student Reference Guide.)*
  4. List the numbers in order.
     Example: The factors of 12 are
     1, 2, 3, 4, 6, 12
- To find the **Greatest Common Factor (GCF)** of two or more numbers:
  1. List (in order) the factors of the *smallest* number.
  2. Starting with the *greatest* factor, cross off any factor that does not divide evenly into each of the other numbers.
  3. Circle the first factor that divides evenly into each of the other numbers. This is the *GCF.*

Teacher Notes:
- Introduce Hint #16, "Factors of Whole Numbers," Hint #17, "Finding the Greatest Common Factor," and Hint #18, "Tests for Divisibility."
- Refer students to "Factors" and "Tests for Divisibility" on page 5 in the *Student Reference Guide.*

Tests for Divisibility
A number is divisible by . . .
2 if the last digit is even.
4 if the last two digits can be divided by 4.
8 if the last three digits can be divided by 8.
5 if the last digit is 0 or 5.
10 if the last digit is 0.
3 if the **sum of the digits** can be divided by 3.
6 if the number can be divided by 2 **and** by 3.
9 if the **sum of the digits** can be divided by 9.
A number ending in . . .
one zero is divisible by 2.
two zeros is divisible by 2 and 4.
three zeros is divisible by 2, 4, and 8.

Practice Set (page 42)

List the whole numbers that are factors of each number.

a. 25 1, ____, ____ **b.** 23 1, ____ **c.** 24 1, ____, ____, ____, ____, ____, ____, ____

List the whole numbers *from 1 to 10* that are factors of each number. *Use Tests for Divisibility.*

d. 1260 1, ____, ____, ____, ____, ____, ____, ____, ____

e. 73,500 1, ____, ____, ____, ____, ____, ____, ____

f. 3600 1, ____, ____, ____, ____, ____, ____, ____, ____

g. List the single-digit divisors of 1356. ____, ____, ____, ____, ____

h. The number 7000 is divisible by which *single-digit* numbers? ____, ____, ____, ____, ____, ____

i. List all the *common* factors of 12 and 20. ____, ____, ____

j. Find the *greatest* common factor (GCF) of 24 and 40. ____

Practice Set (continued) (page 42)

k. How did you find your answer to exercise **j**?

First list the factors of 24: 1, ___, ___, ___, ___, ___, ___, 24

Next cross off any of these that are NOT factors of 40.

The four common factors are: ___, ___, ___, ___ The GCF is ___.

Written Practice (page 43)

1. ( ) ÷ ( ) =
product *sum*

___

2. a. *List the factors of 30:*

___, ___, ___, ___, ___, ___, ___, ___

Cross off the numbers that are NOT factors of 40.

b. GCF
The greatest factor in a. is the GCF.

a. ___, ___, ___, ___

b. ___

3. Use negative odd numbers, braces, ellipses, and digits.

, ___, ___, –1

Use work area.

4. four hundred seven million, six thousand, nine hundred sixty-two

___ ___ ___, ___ ___ ___, ___ ___ ___

5. factors from 1 to 10

12,300

___, ___, ___, ___, ___, ___, ___

6. –7 ◯ –11

words: N___ seven is

g___ than negative

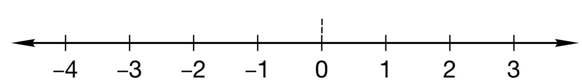
e___.

Use work area.

7. 3456

___, ___, ___, ___, ___, ___, ___

8. 2 – 5



Use work area.

9. expanded notation

6400

(×) + (×)

10. $x + \$4.60 = \$10.00$

$$\begin{array}{r} \$10.00 \\ \underline{6.40} \end{array}$$

$x =$ ______

11. $p - 3850 = 4500$

$$\begin{array}{r} 4500 \\ \underline{3850} \end{array}$$

$p =$ ______

12. $8z = \$50.00$

$z =$ ______

13. *Cross off sets of ten.*

$$\begin{array}{r} 7 \\ 4 \\ 8 \\ 6 \\ 2 \\ 1 \\ 6 \\ 8 \\ 9 \\ \underline{+\ \cancel{n}} \\ 60 \end{array}$$

$n =$ ______

14. $1426 - k = 87$

$$\begin{array}{r} 1426 \\ \underline{87} \end{array}$$

$k =$ ______

15. $\frac{990}{p} = 45$

$p =$ ______

16. $\frac{z}{8} = 32$

$z =$ ______

17. *long division*

$\frac{1225}{35} =$

______

18. *offset*

$$\begin{array}{r} 50 \\ \underline{\times } \end{array}$$

______

19. $\cancel{\$100.00}$
$-$ 48.37

20. 46,302
\+ 49,998

21. *long division*

$45.00

22. $7 \cdot 11 \cdot 13 =$

23. *short division*

$9\overline{)43271}$ R

24. 48¢ + $8.49 + $14 =

25. $1000 - (430 - 58) =$

430
58

1000

26. $140(16) =$

27. 25¢
$\times$ 24

28. *long division*

$\frac{\$43.50}{10} =$

29. $x \cdot 5 = 5x$

a. ______ Property of ______

b. This means that the order of f______

can be c______ without changing the

p______.

Use work area.

30.

$(8 \times 7) \times 5$	Given expression
$8 \times (7 \times 5)$	A______ Property
$8 \times (5 \times 7)$	C______ Property
$(8 \times 5) \times 7$	A______ Property
40×7	$8 \times 5 = 40$
280	$40 \times 7 = 280$

Use work area.

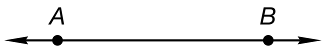
LESSON 7

Lines, Angles and Planes
(page 45)

Name ______________________

> **Teacher Notes:**
> - Introduce Hint #19, "Geometry Vocabulary."
> - Refer students to "Types of Angles" and "Types of Lines" on pages 17 and 18 in the *Student Reference Guide.*
> - Post reference chart, "Angles and Triangles."

- A **plane** is a flat (two-dimensional) surface like a table top.
- A **line** has no end. It extends in opposite directions forever.



Line *AB* or line *BA*; $\overleftrightarrow{AB}$, $\overleftrightarrow{BA}$

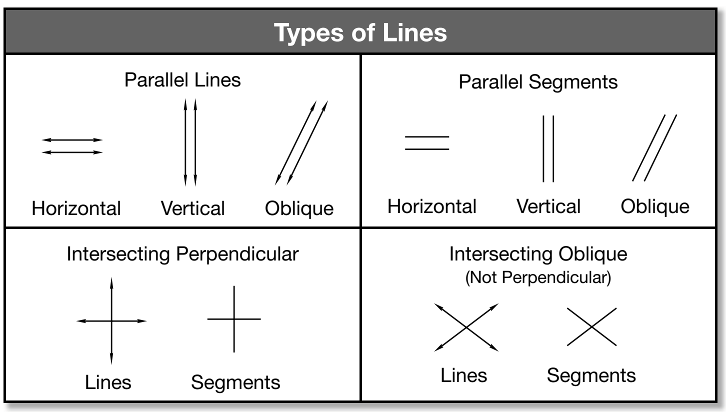
- A **ray** has one endpoint. It extends in one direction forever.

Ray *AB*; $\overrightarrow{AB}$

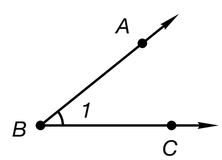
- A **segment** has two endpoints. Its length can be measured.

Segment *AB* or Segment *BA*; $\overline{AB}$, $\overline{BA}$

- The length of $\overline{AB}$ is m$\overline{AB}$ or *AB*.
- When lines cross, they **intersect**.
- **Parallel** lines do not intersect, like railroad tracks.
- **Perpendicular** lines intersect to form square corners, like the corner of a piece of paper.
- Lines that intersect but are *not* perpendicular are **oblique** lines.



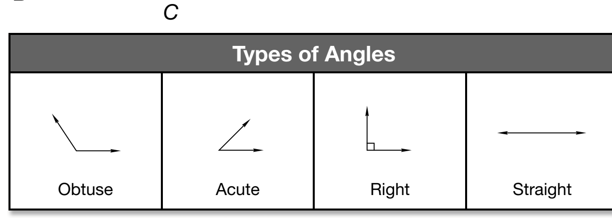
- An **angle** is formed by two rays with a common endpoint, called the **vertex.**
- Angles can be named using the letter of the vertex, three letters with the vertex in the middle, or a number.



Angle *B*, angle *ABC*, angle *CBA*, or angle *1*; ∠*B*, ∠*ABC*, ∠*CBA*, ∠*1*

- An angle is classified by the size of its opening:

  If the opening is a square corner, it is a **right** angle.
  If the opening is smaller than a right angle, it is an **acute** angle.
  If the opening is greater than a right angle, it is an **obtuse** angle.



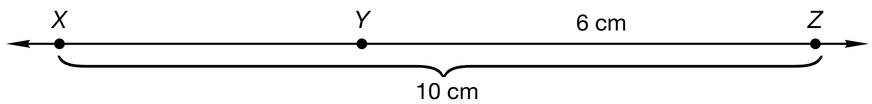
Practice Set (page 50)

a. Name a point on this figure that is *not* on ray *BC.*

point ______

Practice Set (continued) (page 50)

b. In this figure *XZ* is 10 cm and *YZ* is 6 cm. Find *XY*.



_____ cm

c. Draw two *parallel* lines.

d. Draw two *perpendicular* lines.

e. Draw two lines that intersect but are *not* perpendicular. What word describes the relationship of these lines? o__________ lines

f. Draw a *right* angle.

g. Draw an *acute* angle.

h. Draw an *obtuse* angle.

i. Two intersecting segments are drawn on the board. One segment is vertical and the other is horizontal. Are the segments parallel or perpendicular? __________

For **j** and **k**, use classroom words: wall, ceiling, floor.

j. Describe a physical example of parallel planes: f__________ and c__________

k. Describe a physical example of intersecting planes: f__________ and w__________

l. Lines intersect at a point and planes intersect in a l__________.

m. *See top of page 50.* If a power pole represents one line and a paint stripe in the middle of the road represents another line, then the two lines are

A Parallel **B** Intersecting **C** Skew

n. Sketch a part of the classroom where three planes intersect, such as two adjacent walls and the ceiling.

Written Practice (page 50)

1. $a \cdot b = 35$

Which two one-digit numbers multiply to 35?

$a + b =$ __________

2. $-5 \cdot 1 = -5$

I__________ Property of m__________

3. factors of 50

List the numbers that multiply to 50 together.

_____ and _____, _____ and _____, _____ and _____

4. Two minus five equals negative three.

____

5. 90 million

_____ _____, _____ _____ _____, _____ _____ _____

6. single-digit factors of 924

_____, _____, _____, _____, _____, _____

7. least to greatest

−10, 5, −7, 8, 0, −2

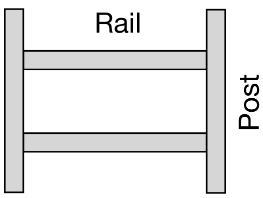
____, ____, ____, ____, ____, ____

8. This is a sequence of perfect squares.
See the times table in the Student Reference Guide.

…, 49, 64, 81, 100, ____, ____, ____

____, ____, ____

9. vertical



____

10. a. *List the factors of 24:*

____, ____, ____, ____, ____, ____, ____, ____

Cross off the numbers that are NOT factors of 32.

b. *The greatest number is the GCF.*

a. ____, ____, ____, ____

b. ________

11. 3°C) =
0°C) =
−4°C

The temperature ________

by ________.

Use work area.

12. $6 \cdot 6 \cdot z = 1224$

$z =$ ________

13. $\$100.00 - k = \$17.54$

$\$100.00$
17.54

$k =$ ________

14. $w - 98 = 432$

432
98

$w =$ ________

15. *long division*

$20x = \$36.00$

$x =$ ________

16. *offset*

$\frac{w}{20} = 200$

$w =$ ________

17. *Cancel matching zeros.*

$\frac{300}{x} = 30$

$x =$ ________

18. $4554 \div 9$ *What is the sum of the digits?* ________

The remainder is z________. You can tell without dividing this way. A number is divisible by 9 if the s________ of its digits is divisible by ____. The sum of the d________ in 4554 is ____, which is divisible by ____.

Use work area.

19. 36,475
\+ 55,984

20. 476
× 38

21. $80.00
72.45

22. *long division*

)$68.00

23. $8 \cdot 7 \cdot 5$ Given expression

$7 \cdot 8 \cdot 5$ C ____________ Property of m ____________

$7 \cdot (8 \cdot 5)$ A ____________ Property of m ____________

$7 \cdot 40$ $8 \cdot 5 = 40$

280 $7 \cdot 40 = 280$

Use work area.

24. *Cancel matching zeros.*

$4000 \div (200 \div 10) =$

$(4000 \div 200) \div 10 =$

_____ ◯ _____

25. $a = 200$ $b = 400$

a. $ab =$

b. $a - b =$

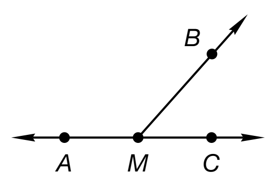
c. $\frac{b}{a} =$

a. ____________

b. ____________

c. ____________

26. **a.** Which angle is an acute angle?
b. Which angle is a straight angle?



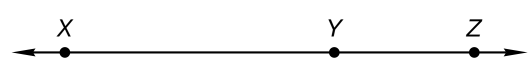
a. ∠ ____________

b. ∠ ____________

27. Perpendicular lines make r ____________ angles.

Use work area.

28. Name three segments.



_____, _____, _____

29. A ____________ m$\overline{XY}$ and m $\overline{}$ ____________ to find m$\overline{XZ}$.

Use work area.

30. Sketch two intersecting planes.
See top of page 50.

Use work area.

LESSON 8

• Fractions and Percents
• Inch Ruler (page 53)

Name ______________________

- A **fraction** is written with two numbers and a division bar.

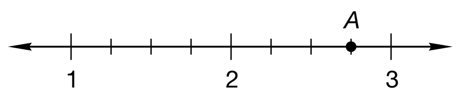
numerator ⟶ $\frac{1}{4}$ ⟵ division bar
denominator ⟶

- The **denominator** shows the total number of parts in the whole. The **numerator** shows how many of the parts are being considered.
- The "denominator" of a percent is always 100.

  25 percent (25%) means $\frac{25}{100}$

- Use fraction manipulatives to change fractions to percents and percents to fractions.
- A **mixed number** is a whole number and a fraction.
- To name a mixed number on a number line:

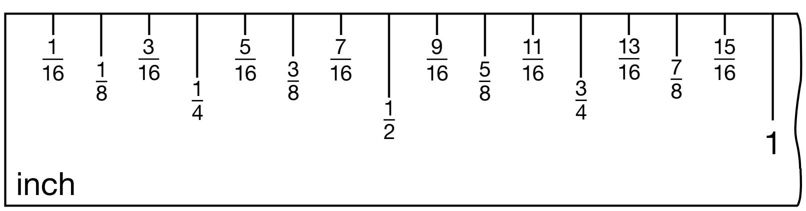
  1. Write the *smaller* of the two whole numbers the point is between: 2



A is at $2\frac{3}{4}$.

  2. Count the number of parts between whole numbers. This is the denominator of the fraction: 4 parts
  3. Count the number of parts after the whole number to the point. This is the numerator of the fraction: 3

- Here is a magnified view of an inch ruler with divisions of $\frac{1}{16}$ of an inch.



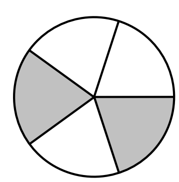
- A measure is **precise** within *half* of the unit used for the measurement. If the unit is $\frac{1}{4}$ of an inch, the measure is **precise** to $\frac{1}{8}$ of an inch.
- The *smaller* the unit is divided the more *precise* the measure becomes.

Teacher Notes:

- Fraction, decimal, and percent tower cubes are available in the Adaptations Manipulative Kit. It is recommended that Adaptations students use these manipulatives rather than the pie-shaped fraction manipulatives introduced in Investigation 1 in the mainstream *Student Edition.*
- If the Adaptations Manipulative Kit is not available, Hint #21, "Fraction Manipulatives," describes how to make paper fraction, decimal, and percent tower manipulatives.
- Introduce Hint #20, "Naming Fractions/Identifying Fractional Parts," Hint #22, "Percent," and Hint #23, "Reading Inch Rulers."
- Refer students to "Fraction Terms" and "Fraction-Decimal-Percent Equivalents" on pages 12 and 13 in the *Student Reference Guide.*
- Beginning with this lesson, students will often require inch rulers to complete the written practice.
- Post reference charts, "Examples of Spelling Numbers" and "Often Used Fractions."

Practice Set (page 57)

Use fraction manipulatives for help.

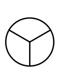


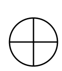
a. What *fraction* of this circle is *not* shaded? ______

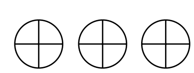
b. What *percent* of this circle is *not* shaded? ________

c. Half of a whole is what percent of the whole? ________

Shade the circles to illustrate each fraction, mixed number, or percent.

d. $\frac{2}{3}$ 

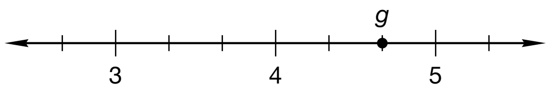
e. 75% 

f. $2\frac{3}{4}$ 

Practice Set (continued) (page 57)

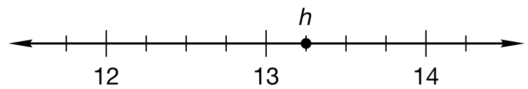
Points **g** and **h** represent what mixed numbers on these number lines?

g.



______

h.



______

i. Find XZ to the nearest sixteenth of an inch.

______ $\frac{\quad}{16}$ in.

j. *A measure is **precise** within* half *of the unit used for the measurement. If the unit is $\frac{1}{4}$ of an inch, the measure is **precise** to $\frac{1}{8}$ of an inch.*

So the precise measure of $\frac{1}{8}$ of an inch would be ______ of an inch.

k. Arrange in order: $\frac{1}{4}, \frac{1}{2}, \frac{1}{8}, \frac{1}{16}$ *Use the ruler shown on the previous page.*

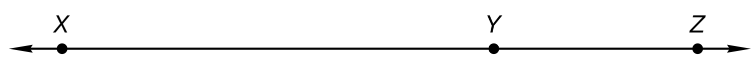
______, ______, ______, ______
least greatest

Written Practice (page 58)

1. One and three fourths is greater than one and three fifths.

$1\frac{3}{4}$ ◯ ______

2.



XY is ______ $\frac{1}{4}$ in.

YZ is ______ $\frac{1}{16}$ in.

3. ( ) ÷ ( ) =
product *sum*

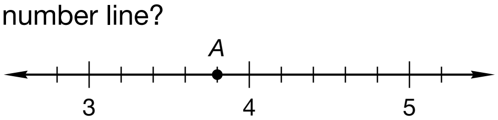
______

4. 1680

1. *Is the last digit 5 or 0?*
2. *Is the last digit even?*
3. *What is the sum of the digits?*

______, ______, ______, ______, ______, ______, ______, ______

5. Point A represents what mixed number on this number line?



______

6. a. 3 + 2 ◯ 2 + 3

b. ____________ Property of ____________

Use work area.

7. 32500000000

First put in commas.

words: ______________________

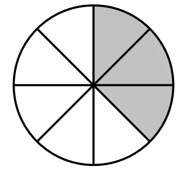
____

____

Use work area.

8. **a.** fraction shaded

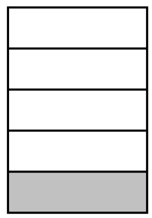
b. fraction not shaded



a. ________ **b.** ________

9. **a.** percent shaded

b. percent not shaded



a. ________ **b.** ________

10. The d____________ indicates the number of equal parts in the *whole.*

Use work area.

11. $a - \$4.70 = \$2.35$

$$\begin{array}{r} \$4.70 \\ \underline{2.35} \end{array}$$

$a =$ ________

12. $b + \$25.48 = \$60.00$

$$\begin{array}{r} \$60.00 \\ \underline{25.48} \end{array}$$

$b =$ ________

13. *short division*

$8c = \$60.00$

$c =$ ________

14. $10{,}000 - d = 5420$

Subtract across zeros.

$$\begin{array}{r} 10{,}000 \\ \underline{5420} \end{array}$$

$d =$ ________

15. $\frac{e}{15} = 15$

$e =$ ________

16. *long division*

$\frac{196}{f} = 14$

$f =$ ________

17. $9 + (n + 8) = 20$ Given equation

$9 + (8 + n) = 20$ **a.** C____________ Property

$(9 + 8) + n = 20$ **b.** A____________ Property

$17 + n = 20$ $9 + 8 = 17$

$n = 3$ $17 + 3 = 20$

Use work area.

18. *offset*

400

____

19. *offset*

$$\begin{array}{r} 79¢ \\ \times \\ \hline \end{array}$$

20.

$$\begin{array}{r} 3625 \\ 431 \\ +\ \ 687 \\ \hline \end{array}$$

21. *Cancel matching zeros.*

6000 ÷ 50 =

22. *offset*

20 · 10 · 5 =

23. *long division*

$\frac{\$27.00}{18} =$

24. *short division*

)3 4 5 6

25. $t = 1000 \quad v = 11$

a. $t - v =$

b. $v - t =$

a. ______

b. ______

26. $k = 3n - 1$

a. 2, 5, 8, 11, ____, ____, ____, ____, ____, ____

b. Pattern: Add ____.

Use work area.

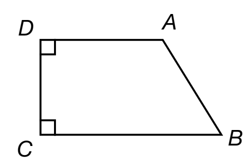
27. 416 − (86 + 119) ○ (416 − 86) + 119

______ ○ ______

28. acute angle ∠ ______

obtuse angle ∠ ______

right angle ∠ ______



Use work area.

29. a. Name a segment *parallel* to $\overline{DA}$.

b. Name a segment *perpendicular* to $\overline{DA}$.

a. ______

b. ______

30. Q R S

$\overline{QR}$ identifies the s______ QR, while QR refers to the d______ from Q to R. So $\overline{QR}$ is a segment and QR is a l______.

Use work area.

LESSON 9

- **Adding, Subtracting, and Multiplying Fractions**
- **Reciprocals** (page 60)

Name ______________________

Teacher Notes:
- Introduce Hint #24, "Reciprocal."
- Review "Fraction Terms" on page 12 in the *Student Reference Guide.*

- To **add** *like* fractions, add the *numerators.* The denominator does not change. $\frac{3}{5} + \frac{2}{5} = \frac{5}{5} = 1$
- As the example shows, a fraction with equal numerator and denominator is equal to 1.
- To **subtract** *like* fractions, subtract the *numerators.* The denominator does not change. $\frac{5}{9} - \frac{1}{9} = \frac{4}{9}$
- To add or subtract **percents,** add or subtract the whole-number parts first. Then add or subtract the fraction parts. The denominator does not change.
- To **multiply** fractions, multiply across *both* numerators and denominators. $\frac{1}{2} \cdot \frac{3}{4} = \frac{3}{8}$
- **Reciprocal** means to "flip" or invert the fraction. $\frac{3}{4} \longrightarrow \frac{4}{3}$
- **Inverse Property of multiplication:** The product of a number and its reciprocal is 1. $\frac{4}{3} \cdot \frac{3}{4} = \frac{12}{12} = 1$

Practice Set (page 63)

a. $\frac{5}{6} + \frac{1}{6} =$ _____

b. $\frac{4}{5} - \frac{3}{5} =$ _____

c. $\frac{3}{5} \times \frac{1}{2} \times \frac{3}{4} =$ _____

d. $\frac{3}{3} + \frac{3}{3} + \frac{2}{3} =$ _____

e. $\frac{4}{7} \times \frac{2}{3} =$ _____

f. $\frac{5}{8} - \frac{5}{8} =$ _____

g. $14\frac{2}{7}\% + 14\frac{2}{7}\% =$ _____

h. $87\frac{1}{2}\% - 12\frac{1}{2}\% =$ _____

Write the *reciprocal* of each number. The product of a number and its reciprocal is *always* _____.

i. $\frac{4}{5} \longrightarrow$

j. $\frac{8}{7} \longrightarrow$

k. $5 \longrightarrow$

Find each missing number. *Think reciprocal for l, m, o, and p.*

l. $\frac{5}{8}a = 1$ $a =$ __________

m. $6m = 1$ $m =$ __________

n. Gia's ruler is divided into tenths $\left(\frac{1}{10}\right)$ of an inch. What fraction of an inch represents the greatest possible measurement error due to Gia's ruler? Why? *A measure is **precise** within* half *of the unit used for the measurement. If the unit is $\frac{1}{4}$ of an inch, the measure is **precise** to $\frac{1}{8}$ of an inch.*

_____ of an inch, because $\frac{1}{2}$ of _____ is _____ .

o. How many $\frac{2}{3}$s are in 1? _____

p. If $a \div b$ equals 4, what does $b \div a$ equal? _____

q. Reciprocals show the __________ Property of multiplication.

Written Practice (page 64)

1. (______) ÷ (______) =

sum *product*

______

2. 

Use work area.

3. a. $\frac{1}{2}$ ◯ $\frac{1}{2} \cdot \frac{1}{2}$

One half is g______ than o______ half times one h______.

b. −2 ◯ −4

N______ two is g______ than negative f______.

Use work area.

4. expanded notation
twenty-six thousand

(×) + (×)

5. a. A dime is what fraction of a dollar?

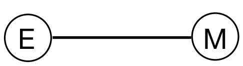
b. A dime is what percent of a dollar?

a. ______ **b.** ______

6. a. fraction shaded

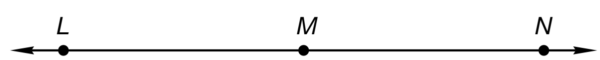
b. fraction not shaded

a. ______ **b.** ______

7. 

It is a s______ because it has two e______.

Use work area.

8. 

LM is ____ in. *MN* is ____ in. *LN* is ____ in.

9. a. List the factors of 18. ____, ____, ____, ____, ____, ____

b. List the factors of 24. ____, ____, ____, ____, ____, ____, ____, ____

c. Which numbers are factors of both 18 and 24? ____, ____, ____, ____

d. Which number is the GCF of 18 and 24? ____

Use work area.

10. $n = \frac{2}{5}$

a. $n + n =$

b. $n - n =$

a. ______ **b.** ______

11. $85{,}000 + b = 200{,}000$

$$\begin{array}{r} 200{,}000 \\ \underline{85{,}000} \end{array}$$

$b =$ ______

12. *Cancel matching zeros.*

$900 \div c = 60$

$c =$ ______

13. *Subtract across zeros.*

$d + \$5.60 = \$20.00$

$$\begin{array}{r} \$20.00 \\ \underline{5.60} \end{array}$$

$d =$ ______

14. *long division*

$e \times 12 = \$30.00$

$e =$ ______

15. $f - \$98.03 = \$12.47$

$$\begin{array}{r} \$98.03 \\ \underline{12.47} \end{array}$$

$f =$ ______

16. *Cross off sets of ten.*

$5 + 7 + 5 + 7 + 6 + n + 1 + 2 + 3 + 4 = 40$

$n =$ ______

17.

$$\begin{array}{r} 3\frac{11}{15} \\ \underline{-\ 1\frac{3}{15}} \end{array}$$

______

18.

$$\begin{array}{r} 1\frac{3}{8} \\ \underline{+\ 1\frac{4}{8}} \end{array}$$

______

19. $\frac{3}{4} \times \frac{1}{4} =$

______

20. *long division*

$\frac{1802}{17} =$

______

21. $\$6\cancel{0}.\cancel{0}0 - \$49.49$

22. 607×78

23. $\frac{4}{5} \times \frac{2}{3} \times \frac{1}{3} =$

24. $\frac{1}{9} + \frac{2}{9} + \frac{4}{9} =$

25.

$50 \times 36 \times 20$	Given
$50 \times$ ______ $\times$ ______	C__________ Property
$(50 \times$ ______$) \times$ ______	A__________ Property
$1000 \times$ ______	$50 \times 20 =$ ______
36,000	$1000 \times$ ______ $=$ ______

Use work area.

26. $\frac{4}{5} \times \frac{5}{4} = 1$

This shows the I__________ Property

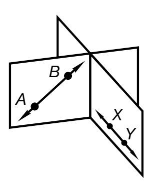
of m__________.

Use work area.

27. Lines *AB* and *XY* lie in different planes. Which word best describes their relationship?

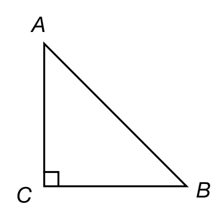
A Intersecting **B** Skew **C** Parallel

See top of page 50.



28. a. Which angles are acute?

b. Which segment is perpendicular to $\overline{CB}$?



a. ∠______ and ∠______ **b.** ______

29. $\frac{1}{2}, \frac{1}{4}, \frac{1}{8},$ ______ …

Each term is h__________ of the

preceding t__________.

30. How many $\frac{2}{5}$s are in 1?

Think reciprocal.

LESSON 10

• Writing Division Answers as Mixed Numbers
• Improper Fractions (page 66)

Name ____________________

Teacher Notes:
- Introduce Hint #25, "Improper Fractions."
- Refer students to "Mixed Numbers and Improper Fractions" on page 12 in the *Student Reference Guide.*

- To write the *answer* as a **mixed number:**
  Show the *remainder* as the *numerator* and the **divisor** as the **denominator** of the fraction.

$$\begin{array}{r} 6\frac{1}{4} \\ 4\overline{)25} \\ \underline{24} \\ 1 \end{array}$$

- An **improper fraction** is a fraction whose numerator is equal to or greater than its denominator (top-heavy fraction).
- If the answer to an arithmetic problem is an improper fraction, **convert** it to a mixed number.
- To change an **improper fraction** to a *mixed number:*
  Divide the denominator into the numerator.

$$\frac{5}{3} \longrightarrow \begin{array}{r} 1 \\ 3\overline{)5} \\ \underline{3} \\ 2 \end{array} \longrightarrow \mathbf{1\frac{2}{3}}$$

- To change a *mixed number* to an **improper fraction:**
  Multiply, then add. Keep the same denominator.

$$3\frac{1}{4} \longrightarrow 3\frac{+1}{\times 4} = \frac{(4 \times 3) + 1}{4} = \frac{13}{4}$$

Practice Set (page 70)

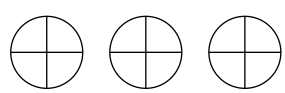
a. Alexis cut a 35-inch ribbon into four equal lengths. How long was each of the shorter pieces of ribbon? $\overline{)35}$ ________

b. One day is what percent of one week? $\overline{)100\%}$ ________

Convert each improper fraction to either a whole number or a mixed number.

c. $\frac{12}{5} \longrightarrow$ **d.** $\frac{12}{6} \longrightarrow$ **e.** $2\frac{12}{7} \longrightarrow$

f. Shade the circles to illustrate that $2\frac{1}{4} = \frac{9}{4}$.



Simplify:

g. $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} =$ ______ $=$ ______ **h.** $\frac{7}{3} \times \frac{2}{3} =$ ______ $=$ ______ **i.** $1\frac{2}{3} + 1\frac{2}{3} =$ ______ $=$ ______

Convert each mixed number to an improper fraction:

j. $1\frac{+2}{\times 3} =$ ______ **k.** $3\frac{+5}{\times 6} =$ ______ **l.** $4\frac{3}{4} =$ ______

m. $5\frac{1}{2} =$ ______ **n.** $6\frac{3}{4} =$ ______ **o.** $10\frac{2}{5} =$ ______

p. Write 3 different improper fractions for the number 4, such as $\frac{12}{3}$. $\frac{\quad}{4}, \frac{\quad}{5}, \frac{\quad}{6}$

Written Practice (page 70)

1. Write in parentheses to show the *Associative* Property of multiplication.

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

Use work area.

2. 

In a rectangle, opposite sides are

p__________ and adjacent (touching) sides

are p__________.

Use work area.

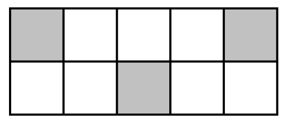
3. (   ) − (   ) =

product   *sum*

____

4. a. percent shaded

b. percent not shaded



a. ______________

b. ______________

5. $3\,\frac{+2}{\times 3} = \frac{\quad}{3}$

____

6. a. 2 − 2   2 ÷ 2

↓   ↓

_____ ○ _____

b. $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} \times \frac{1}{2}$

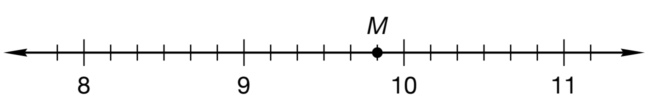
↓   ↓

_____ ○ _____

a. ______________

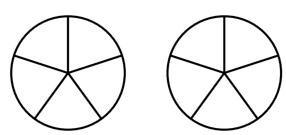
b. ______________

7. mixed number



____

8. $1\frac{3}{5} = \frac{8}{5}$



Use work area.

9. 420

1. *Is the last digit 5 or 0?*

2. *Is the last digit even?*

3. *What is the sum of the digits?*

_____, _____, _____, _____, _____, _____, _____

10. $12{,}500 + x = 36{,}275$

$$\begin{array}{r} 36{,}275 \\ \underline{\quad 12{,}500} \end{array}$$

$x =$ ______________

11. *long division*

$18y = 396$

$y =$ ______

12. $77{,}000 - z = 39{,}400$

$$\begin{array}{r} 77{,}000 \\ \underline{39{,}400} \end{array}$$

$z =$ ______

13. $\frac{a}{8} = \$1.25$

$a =$ ______

14. $b - \$16.25 = \$8.75$

$$\begin{array}{r} \$16.25 \\ \underline{8.75} \end{array}$$

$b =$ ______

15. $c + \$37.50 = \$75.00$

$$\begin{array}{r} \$75.00 \\ \underline{37.50} \end{array}$$

$c =$ ______

16. least to greatest

$\frac{1}{2}, \frac{3}{8}, \frac{3}{4}, \frac{1}{16}$

______, ______, ______, ______

17. *Convert.*

$\frac{5}{2} \times \frac{5}{4} =$

______

18. $\frac{5}{8} - \frac{5}{8} =$

______

19. *Convert.*

$\frac{11}{20} + \frac{18}{20} =$

______

20. *Subtract across zeros.*

$2000 - (680 - 59) =$

$$\begin{array}{r} 680 \\ \underline{59} \end{array} \qquad \begin{array}{r} 2000 \\ \underline{} \end{array}$$

______

21. *mixed number short division*

$\overline{)1\ 0\ 0\%}$

____

22. $15.74

$\quad\ .$

$\quad\ .$

____

____

23. *offset*

800

____

24. *Convert.*

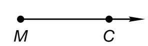
$$\begin{array}{r} 2\frac{2}{3} \\ +\ 2\frac{2}{3} \\ \hline \end{array}$$

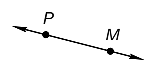
____

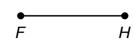
25. $\frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} =$

____

26. line, ray, or segment

a. 

b. 

c. 

describe: _______ _______ _______

name: _______ _______ _______

Use work area.

27. How many $\frac{5}{9}$s are in 1?

Think reciprocal.

____

28. …, 32, 16, 8, 4, 2, _____, _____, _____ …

_____, _____, _____

29. Which of these numbers is not an integer?

A −1 **B** 0 **C** $\frac{1}{2}$ **D** 1

See "Number Families" in the Student Reference Guide.

____

30. *Change the variables to digits.*

a. If $a - b = 5$, then what does $b - a$ equal? **a.** _______

b. If $\frac{w}{x} = 3$, then what does $\frac{x}{w}$ equal? **b.** _______

c. How are $\frac{w}{x}$ and $\frac{x}{w}$ related?

They are r_______.

Use work area.