

MSP

Grade 6 Module 4

Lesson Refreshers

&

Homework Starters

Problem Set

1. Fill in each blank.

a. $\underline{\quad} + 15 - 15 = 21$

b. $450 - 230 + 230 = \underline{\quad}$

c. $1289 - \underline{\quad} + 856 = 1289$

2. Why are the equations $w - x + x = w$ and $w + x - x = w$ called *identities*?

These equations are called identities because the variables can be replaced with any numbers, and after completing the operations, I returned to the original value.

* ie - $w - x + x = w$
 $w = 4; x = 1$
 $4 - 1 + 1 = 4$

$w + x - x = w$
 $w = 6; x = 2$
 $6 + 2 - 2 = 6$

Problem Set

1. Fill in each blank to make the equation true.

a. $132 \div 3 \times 3 = \underline{\quad}$

b. $\underline{\quad} \div 25 \times 25 = 225$

c. $56 \times \underline{\quad} \div 8 = 56$

d. $452 \times 12 \div \underline{\quad} = 452$

2. How is the relationship of addition and subtraction similar to the relationship of multiplication and division?

Both relationships create identities.

$$a + b - b = a$$

$$a = 4 ; b = 5$$

$$4 + 5 - 5 = 4$$

$$c \cdot e \div e = c$$

$$c = 6 ; e = 2$$

$$6 \cdot 2 \div 2 = 6$$

Problem Set

Write an equivalent expression to show the relationship of multiplication and addition.

1. $10 + 10 + 10$

2. $4 + 4 + 4 + 4 + 4 + 4 + 4$

3. $8 \times 2 \rightarrow 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$

4. 3×9

5. $6m$

6. $d + d + d + d + d$

Hint: Both equations should have the same answer.

$$8 \times 2 = 16$$

$$2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 16$$

Problem Set

Build subtraction equations using the indicated equations.

	Division Equation	Divisor Indicates the Size of the Unit	Tape Diagram <i>per group</i>	What is x, y, z ?
1.	$24 \div x = 4$	$24 - x - x - x - x = 0$	$24 - x - x - x - x = 0; x = 6$ units ^{per group} 	$x = 6$
2.	$36 \div x = 6$			
3.	$28 \div y = 7$			
4.	$30 \div y = 5$			
5.	$16 \div z = 4$			

	Division Equation	Divisor Indicates the Number of Units	Tape Diagram	What is x, y, z ?
1.	$24 \div x = 4$	$24 - 4 - 4 - 4 - 4 = 0$	$24 - 4 - 4 - 4 - 4 = 0; x = 6$ groups 	$x = 6$
2.	$36 \div x = 6$			
3.	$28 \div y = 7$			
4.	$30 \div y = 5$			
5.	$16 \div z = 4$			

Lesson Summary

EXPONENTIAL NOTATION FOR WHOLE NUMBER EXPONENTS: Let m be a nonzero whole number. For any number a , the expression a^m is the product of m factors of a , i.e.,

$$a^m = \underbrace{a \cdot a \cdot \dots \cdot a}_{m \text{ times}}$$

The number a is called the *base*, and m is called the *exponent* or *power* of a .

When m is 1, “the product of one factor of a ” just means a (i.e., $a^1 = a$). Raising any nonzero number a to the power of 0 is defined to be 1 (i.e., $a^0 = 1$ for all $a \neq 0$).

Problem Set

- Complete the table by filling in the blank cells. Use a calculator when needed.

Exponential Form	Expanded Form	Standard Form
3^5	$3 \times 3 \times 3 \times 3 \times 3$	243
4^3	$4 \times 4 \times 4$	64
$(1.9)^2$	1.9×1.9	3.61
$(\frac{1}{2})^5$	$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	$\frac{1}{32}$

- Why do whole numbers raised to an exponent get greater, while fractions raised to an exponent get smaller?
- The powers of 2 that are in the range 2 through 1,000 are 2, 4, 8, 16, 32, 64, 128, 256, and 512. Find all the powers of 3 that are in the range 3 through 1,000.
- Find all the powers of 4 in the range 4 through 1,000.
- Write an equivalent expression for $n \times a$ using only addition.
- Write an equivalent expression for w^b using only multiplication.
 - Explain what w is in this new expression.
 - Explain what b is in this new expression.
- What is the advantage of using exponential notation?
- What is the difference between $4x$ and x^4 ? Evaluate both of these expressions when $x = 2$.

Lesson Summary

NUMERICAL EXPRESSION: A *numerical expression* is a number, or it is any combination of sums, differences, products, or divisions of numbers that evaluates to a number.

Statements like “3 +” or “3 ÷ 0” are not numerical expressions because neither represents a point on the number line. Note: Raising numbers to whole number powers are considered numerical expressions as well since the operation is just an abbreviated form of multiplication, e.g., $2^3 = 2 \cdot 2 \cdot 2$.

VALUE OF A NUMERICAL EXPRESSION: The *value of a numerical expression* is the number found by evaluating the expression.

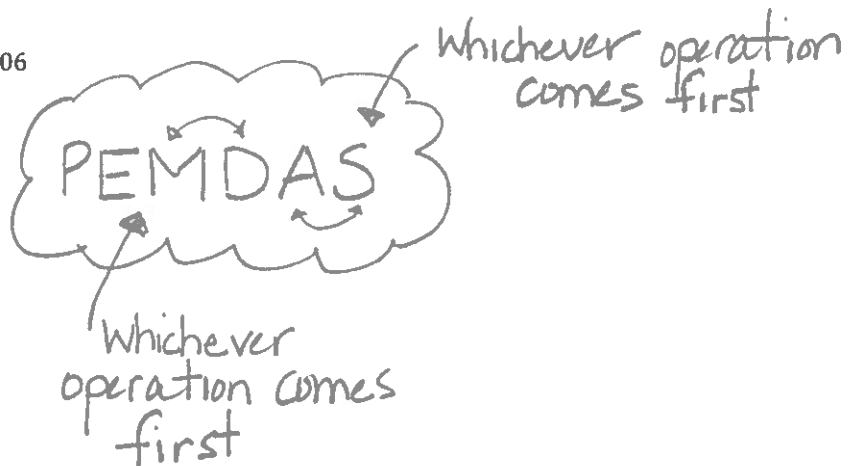
For example: $\frac{1}{3} \cdot (2 + 4) + 7$ is a numerical expression, and its value is 9.

Problem Set

Evaluate each expression.

1. $3 \times 5 + 2 \times 8 + 2$
2. $(\$1.75 + 2 \times \$0.25 + 5 \times \$0.05) \times 24$
3. $(2 \times 6) + (8 \times 4) + 1$
4. $((8 \times 1.95) + (3 \times 2.95) + 10.95) \times 1.06$

5. $((12 \div 3)^2 - (18 \div 3^2)) \times (4 \div 2)$
 $(4^2 - (18 \div 9)) \times (4 \div 2)$
 $(16 - 2) \times 2$
 14×2
 28



S. Hill

3. Find the perimeter of each quadrilateral in Problems 1 and 2.

4. Using the formula $V = l \times w \times h$, find the volume of a right rectangular prism when the length of the prism is 45 cm, the width is 12 cm, and the height is 10 cm.

$$V = l \times w \times h$$

$$V = 45 \text{ cm} \times 12 \text{ cm} \times 10 \text{ cm}$$

$$V = 5,400 \text{ cm}^3$$

** Tip*
 ↓ The Commutative Property states that order doesn't matter for addition & multiplication

Problem Set

1. State the commutative property of addition using the variables a and b .
 $a + b = b + a$
2. State the commutative property of multiplication using the variables a and b .
3. State the additive property of zero using the variable b .
4. State the multiplicative identity property of one using the variable b .
5. Demonstrate the property listed in the first column by filling in the third column of the table.

Commutative Property of Addition	$25 + c =$	
Commutative Property of Multiplication	$l \times w =$	
Additive Property of Zero	$h + 0 =$	
Multiplicative Identity Property of One	$v \times 1 =$	

6. Why is there no commutative property for subtraction or division? Show examples.

Problem Set

- Write two expressions to show a number increased by 11. Then, draw models to prove that both expressions represent the same thing.
- Write an expression to show the sum of x and y .
- Write an expression to show h decreased by 13.
- Write an expression to show k less than 3.5.
- Write an expression to show the sum of g and h reduced by 11. $\xrightarrow{\text{ans.}} (g+h) - 11$
- Write an expression to show 5 less than y , plus g .
- Write an expression to show 5 less than the sum of y and g .

Tip(s):

- Underline words that help to determine operations
- Write the symbols above the key words
- determine if parentheses are needed, if so why

Lesson Summary

AN EXPRESSION IN EXPANDED FORM: An expression that is written as sums (and/or differences) of products whose factors are numbers, variables, or variables raised to whole number powers is said to be in *expanded form*. A single number, variable, or a single product of numbers and/or variables is also considered to be in expanded form.

Problem Set

1. Rewrite the expression in standard form (use the fewest number of symbols and characters possible).

- a. $5 \cdot y$
- b. $7 \cdot d \cdot e$
- c. $5 \cdot 2 \cdot 2 \cdot y \cdot z$
- d. $3 \cdot 3 \cdot 2 \cdot 5 \cdot d \rightarrow 90d$

2. Write the following expressions in expanded form.

- a. $3g$
- b. $11mp$
- c. $20yz$
- d. $15abc$

3. Find the product.

- a. $5d \cdot 7g$
- b. $12ab \cdot 3cd$

Tip(s):

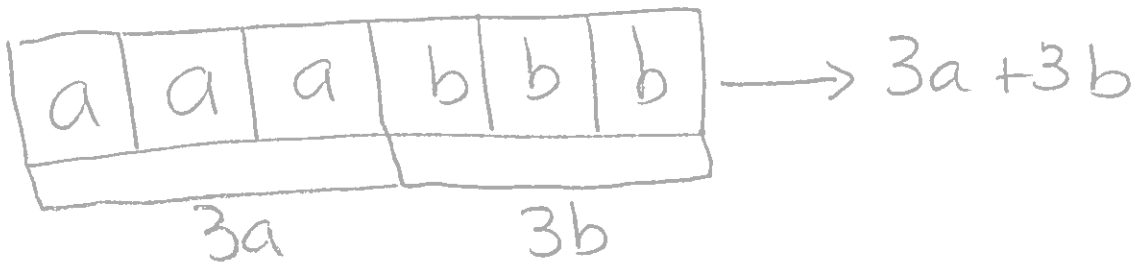
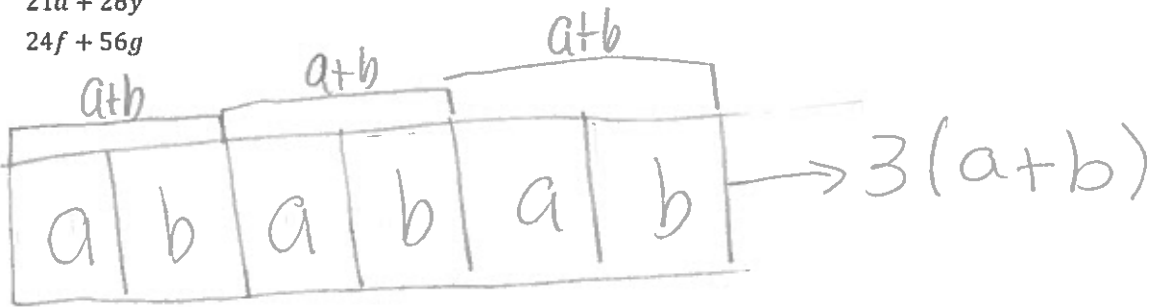
- 1. read directions carefully and underline key words
- 2. multiply all numbers
- 3. eliminate the dots and write the variable

Lesson Summary

AN EXPRESSION IN FACTORED FORM: An expression that is a product of two or more expressions is said to be in *factored form*.

Problem Set

1. Use models to prove that $3(a + b)$ is equivalent to $3a + 3b$.
2. Use greatest common factor and the distributive property to write equivalent expressions in factored form for the following expressions.
 - a. $4d + 12e$
 - b. $18x + 30y$
 - c. $21a + 28y$
 - d. $24f + 56g$



Tips:

1. in the first model, there are 3 groups of $a+b$
2. in the second, put the a 's together & then the b 's
3. you should notice that there are the same amount of a 's and b 's

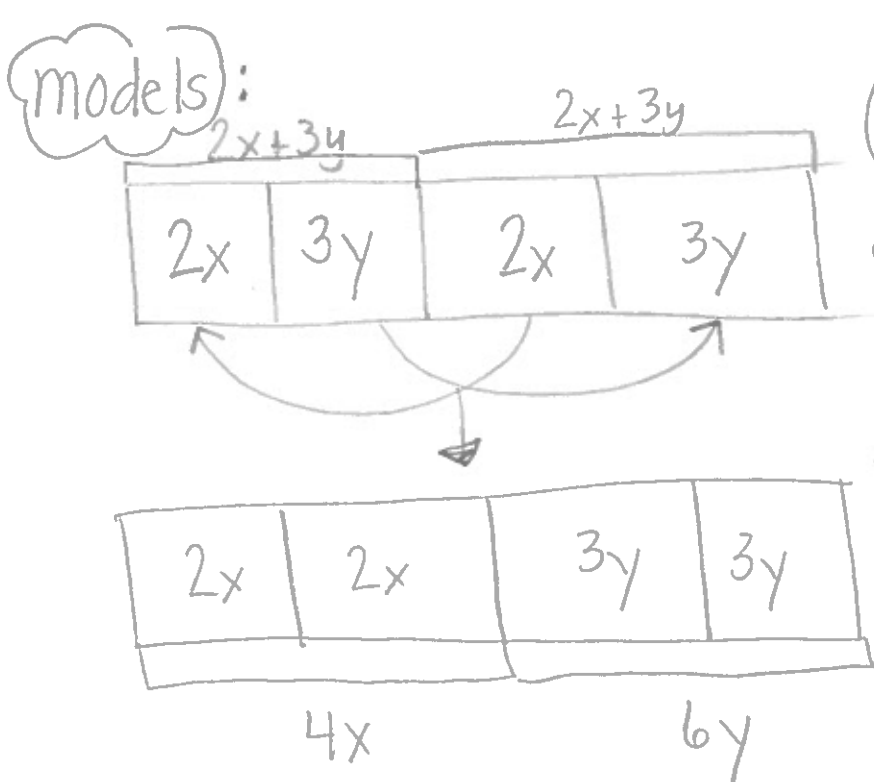
PLW

Problem Set

1. Use the distributive property to write the following expressions in expanded form.

- a. $4(x + y)$
- b. $8(a + 3b)$
- c. $3(2x + 11y)$
- d. $9(7a + 6b)$
- e. $c(3a + b)$
- f. $y(2x + 11z)$

★2. Create a model to show that $2(2x + 3y) = 4x + 6y$.



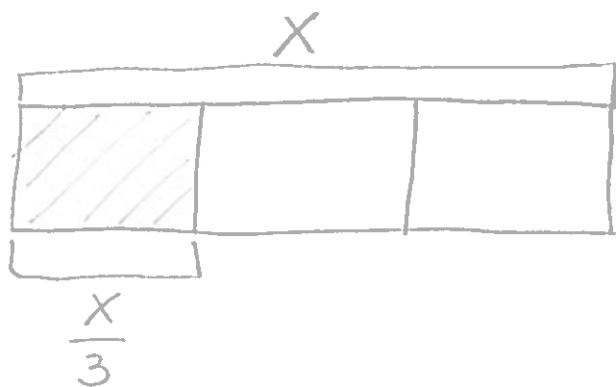
Tips:

- In the first model, $2x + 3y$ is shown together
- In the equivalent model, there are 2 groups of each, so they're grouped together
- $2(2x + 3y) = 4x + 6y$

PLW

Problem Set

1. Rewrite the expressions using the division symbol and as a fraction.
 - a. Three divided by 4
 - b. The quotient of m and 11
 - c. 4 divided by the sum of h and 7
 - d. The quantity x minus 3 divided by y
2. Draw a model to show that $x \div 3$ is the same as $\frac{x}{3}$.



Hint:

- the whole is x
- the whole is divided into 3 parts
- each part is $\frac{x}{3}$

PLW

remember the dividend is the whole and the divisor is the group

Problem Set

Complete the missing spaces in each rectangle set.

$16 \overline{)h}$	
$h \div 16$	_____

\div	$\frac{m}{b - 33}$

7 divided by x	
\div	_____

	$2 \overline{)y + 13}$
\div	_____

PLW

Problem Set

1. List five different vocabulary words that could be used to describe each given expression.

a. $a - d + c$

b. $20 - 3c$

c. $\frac{b}{d+2}$

2. Write an expression using math vocabulary for each expression below.

a. $5b - 18$

b. $\frac{n}{2}$

c. $a + (d - 6)$

d. $10 + 2b$

- 1.a. Subtract, add, difference, sum, total
b. Subtract, difference, multiply, product, triple
c. Divided by, sum, add, quotient, increase

Hint

↳ Use the words that were used during the opening

PLW

Problem Set

Mark the text by underlining key words, and then write an expression using variables and numbers for each of the statements below.

- Justin can type w words per minute. Melvin can type 4 times as many words as Justin. Write an expression that represents the rate at which Melvin can type.
- Yohanna swam y yards yesterday. Sheylin swam 5 yards less than half the amount of yards as Yohanna. Write an expression that represents the number of yards Sheylin swam yesterday.
- A number d is decreased by 5 and then doubled.
- Nahom had n baseball cards, and Semir had s baseball cards. They combined their baseball cards and then sold 10 of them.

5. The sum of 25 and h is divided by f cubed.

$$\frac{25+h}{f^3} \text{ or } (25+h) \div f^3$$

Tips:

- Underline key words
- Write symbols above words
- Reread to help write expressions

Problem Set

Write an expression using letters and/or numbers for each problem below.

1. 4 less than the quantity of 8 times n
2. 6 times the sum of y and 11
3. The square of m reduced by 49
4. The quotient when the quantity of 17 plus p is divided by 8
5. Jim earned j in tips, and Steve earned s in tips. They combine their tips and then split them equally.
6. Owen has c collector cards. He quadruples the number of cards he has and then combines them with Ian, who has i collector cards.
7. Rae runs 4 times as many miles as Madison and Aaliyah combined. Madison runs m miles, and Aaliyah runs a miles.
8. By using coupons, Mary Jo is able to decrease the retail price of her groceries, g , by \$125.
9. To calculate the area of a triangle, you find the product of the base and height and then divide by 2.
10. The temperature today was 10 degrees ⁻¹⁰ colder than twice yesterday's temperature, t . _{2t}

ans. $2t - 10$

★ Underlining and writing the operation above is a good practice



Problem Set

1. Read each story problem. Identify the unknown quantity, and write the addition or subtraction expression that is described. Finally, evaluate your expression using the information given in column four.

Story Problem	Description with Units	Expression	Evaluate the Expression If:	Show Your Work and Evaluate
Sammy has two more baseballs than his brother Ethan.	Let e represent the number of balls Ethan has.	$e + 2$	Ethan has 7 baseballs.	$e + 2$ $7 + 2$ $\boxed{9}$ Sammy has 9 baseballs.
Ella wrote 8 more stories than Anna in the fifth grade.	Let s represent the number of stories Anna wrote in the fifth grade.	$s + 8$	Anna wrote 10 stories in the fifth grade.	$s + 8$ $10 + 8$ $\boxed{18}$ Ella wrote 18 stories in the 5 th grade.
Lisa has been dancing for 3 more years than Danika.	Let y represent the number of years Danika has been dancing.	$y + 3$	Danika has been dancing for 6 years.	$y + 3$ $6 + 3$ $\boxed{9}$ Lisa has been dancing for 9 years.
The New York Rangers scored 2 fewer goals than the Buffalo Sabres last night.	Let g represent the number of goals scored by the Rangers.	$g + 2$	The Rangers scored 3 goals last night.	$g + 2$ $3 + 2$ $\boxed{5}$ The Buffalo Sabres scored 5 goals last night.
George has gone camping 3 times fewer than Dave.	Let c represent the number of times George has gone camping.	$c + 3$	George has gone camping 8 times.	$c + 3$ $8 + 3$ $\boxed{11}$ Dave has gone camping 11 times.

2. If George went camping 15 times, how could you figure out how many times Dave went camping?

Problem Set

- Suellen and Tara are in sixth grade, and both take dance lessons at Twinkle Toes Dance Studio. This is Suellen's first year, while this is Tara's fifth year of dance lessons. Both girls plan to continue taking lessons throughout high school.
 - Complete the table showing the number of years the girls will have danced at the studio.

Grade	Suellen's Years of Experience Dancing	Tara's Years of Experience Dancing
Sixth		
Seventh		
Eighth		
Ninth		
Tenth		
Eleventh		
Twelfth		

- If Suellen has been taking dance lessons for Y years, how many years has Tara been taking lessons?
- Daejoy and Damian collect fossils. Before they went on a fossil-hunting trip, Daejoy had 25 fossils in her collection, and Damian had 16 fossils in his collection. On a 10-day fossil-hunting trip, they each collected 2 new fossils each day.
 - Make a table showing how many fossils each person had in their collection at the end of each day.

TIP
(Skip count by 2)

Day	# of Fossils in Daejoy's Collection	# of Fossils in Damian's Collection
1	27	18
2	29	20
3	31	22
4	33	24
5	35	26
6	37	28
7	39	30
8	41	32
9	43	34
10	45	36

SC

- If this pattern of fossil finding continues, how many fossils does Damian have when Daejoy has F fossils?
- If this pattern of fossil finding continues, how many fossils does Damian have when Daejoy has 55 fossils?

(b) When Daejoy has F fossils, Damian has $F - 9$ fossils.

(c) $55 - 9 = 46$
When Daejoy has 55 fossils, Damian has 46 fossils.

4. Mitchell delivers newspapers after school, for which he earns \$0.09 per paper. Create a table of values that shows the relationship between the number of papers that Mitchell delivers, P , and the amount of money Mitchell earns in dollars, E .

- If you know how many papers Mitchell delivered, can you determine how much money he earned? Write the corresponding expression.
- Use your expression to determine how much Mitchell earned by delivering 300 newspapers.
- If you know how much money Mitchell earned, can you determine how many papers he delivered? Write the corresponding expression.
- Use your expression to determine how many papers Mitchell delivered if he earned \$58.50 last week.

5. Randy is an art dealer who sells reproductions of famous paintings. Copies of the *Mona Lisa* sell for \$475.
- Last year Randy sold \$9,975 worth of *Mona Lisa* reproductions. How many did he sell?
 - If Randy wants to increase his sales to at least \$15,000 this year, how many copies will he need to sell (without changing the price per painting)?

a) $9,975 \div 475$

$$\begin{array}{r}
 21 \\
 \hline
 475 \overline{) 9,975} \\
 \underline{- 950} \downarrow \\
 475 \\
 \underline{- 475} \\
 0
 \end{array}$$

He sold
= 21 copies
of the painting

b) $15,000 \div 475$

$$\begin{array}{r}
 31 R^{275} \\
 \hline
 475 \overline{) 15,000} \\
 \underline{- 1425} \downarrow \\
 6750 \\
 \underline{- 675} \\
 275
 \end{array}$$

$31 R^{275} \approx 32$

= 32 paintings
in order to increase
his sales to at
least \$15,000

Problem Set

1. Compact discs (CDs) cost \$12 each at the Music Emporium. The company charges \$4.50 for shipping and handling, regardless of how many compact discs are purchased.
 - a. Create a table of values that shows the relationship between the number of compact discs that Mickey buys, D , and the amount of money Mickey spends, C , in dollars.

Number of CDs Mickey Buys (D)	Total Cost in Dollars (C)
1	
2	
3	

- b. If you know how many CDs Mickey orders, can you determine how much money he spends? Write the corresponding expression.
- c. Use your expression to determine how much Mickey spent buying 8 CDs.

2. Mr. Gee's class orders paperback books from a book club. The books cost \$2.95 each. Shipping charges are set at \$4.00, regardless of the number of books purchased.

- a. Create a table of values that shows the relationship between the number of books that Mr. Gee's class buys, B , and the amount of money they spend, C , in dollars.

Number of Books Ordered (B)	Amount of Money Spent in Dollars (C)
1	6.95
2	9.90
3	12.85

- b. If you know how many books Mr. Gee's class orders, can you determine how much money they spend? Write the corresponding expression.
- c. Use your expression to determine how much Mr. Gee's class spent buying 24 books.

b) $\$2.95B + 4$

c) $24(2.95) + 4$

$\$76.80 + 4$

$= \$74.80$

Mr. Gee's class
Spent \$74.80

3. The athletics director at Peter's school has created a phone tree that is used to notify team players in the event a game has to be canceled or rescheduled. The phone tree is initiated when the director calls two captains. During the second stage of the phone tree, the captains each call two players. During the third stage of the phone tree, these players each call two other players. The phone tree continues until all players have been notified. If there are 50 players on the teams, how many stages will it take to notify all of the players?

★ It will take 5 stages.

★ After the 1st stage, 2 players have been called and 48 will not have been called.

★ After the 2nd stage, 4 more players have been called for a total of 6. 44 players will remain uncalled.

★ After the 3rd stage, 2^3 players (eight) more will have been called = 14. 36 remain uncalled.

★ After the 4th stage 2^4 more players (16) will have gotten a call. 30 players notified.

★ 5th stage will cover all of them, 2^5 . Includes 32 more players.

Lesson Summary

NUMBER SENTENCE: A *number sentence* is a statement of equality (or inequality) between two numerical expressions.

TRUTH VALUES OF A NUMBER SENTENCE: A number sentence is said to be *true* if both numerical expressions evaluate to the same number; it is said to be *false* otherwise. True and false are called *truth values*.

Number sentences that are inequalities also have truth values. For example, $3 < 4$, $6 + 8 > 15 - 12$, and $(15 + 3)^2 < 1,000 - 32$ are all true number sentences, while the sentence $9 > 3(4)$ is false.

Problem Set

50 Substitute the value into the variable, and state (in a complete sentence) whether the resulting number sentence is true or false. If true, find a value that would result in a false number sentence. If false, find a value that would result in a true number sentence.

1. $3\frac{5}{6} = 1\frac{2}{3} + h$. Substitute $2\frac{1}{6}$ for h .

When $2\frac{1}{6}$ is substituted in for h , the number sentence is true. Any value for h other than $2\frac{1}{6}$ will result in a false number sentence.

2. $39 > 156g$. Substitute $\frac{1}{4}$ for g .

3. $\frac{f}{4} \leq 3$. Substitute 12 for f .

4. $121 - 98 \geq r$. Substitute 23 for r .

5. $\frac{54}{q} = 6$. Substitute 10 for q .

Create a number sentence using the given variable and symbol. The number sentence you write must be true for the given value of the variable.

6. Variable: d Symbol: \geq The sentence is true when 5 is substituted for d .

7. Variable: y Symbol: \neq The sentence is true when 10 is substituted for y .

8. Variable: k Symbol: $<$ The sentence is true when 8 is substituted for k .

9. Variable: a Symbol: \leq The sentence is true when 9 is substituted for a .

Problem Set

50

State when the following equations and inequalities will be true and when they will be false.

1. $\frac{36}{9} = \frac{9k}{9} = 4$

2. $67 > f - 15$

3. $\frac{v}{9} = 3$

4. $10 + b > 42$

5. $d - 8 \geq 35$

6. $32f < 64$

7. $10 - h \leq 7$

8. $42 + 8 \geq g$

9. $\frac{m}{3} = 14$

* The equation is true because the value of k is 4, it is false when the value of k is any number other than 4.
 T = k = 4
 F = k ≠ 4

Lesson Summary

VARIABLE: A *variable* is a symbol (such as a letter) that is a placeholder for a number.

A variable is a placeholder for “a number” that does not “vary.”

EXPRESSION: An *expression* is a numerical expression, or it is the result of replacing some (or all) of the numbers in a numerical expression with variables.

EQUATION: An *equation* is a statement of equality between two expressions.

If A and B are two expressions in the variable x , then $A = B$ is an equation in the variable x .

Problem Set

Find the solution to each equation.

1. $4^3 = y$

2. $8a = 24$

3. $32 = g - 4$

4. $56 = j + 29$

5. $\frac{48}{r} = 12$

6. $k = 15 - 9$

7. $x \cdot \frac{1}{5} = 60$

8. $m + 3.45 = 12.8$

9. $a = 1^5$

① Solve the equation
 $4^3 = 64$

② $64 = y$

① Look and determine the original operation
 $8a = 24$ (multiplication)

② Use the opposite operation on both sides
Starting where the variable (letter) is.

$$\frac{8a}{8} = \frac{24}{8}$$

$$a = 3$$

MF

Problem Set

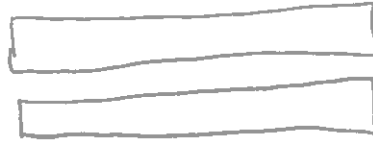
1. Find the solution to the equation below using tape diagrams. Check your answer.

$$m - 7 = 17$$

2. Find the solution of the equation below algebraically. Check your answer.

$$n + 14 = 25$$

① Draw two tape diagrams that are the same length



② Label the first tape diagram 18



③ Represent the second tape diagram



3. Find the solution of the equation below using tape diagrams. Check your answer.

$$p + 8 = 18$$

4. Find the solution to the equation algebraically. Check your answer.

$$g - 62 = 14$$

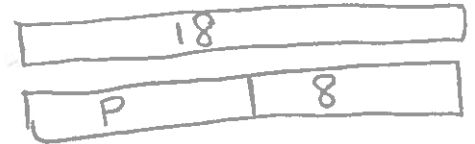
5. Find the solution to the equation using the method of your choice. Check your answer.

$$m + 108 = 243$$

6. Identify the mistake in the problem below. Then, correct the mistake.

$$\begin{aligned} p - 21 &= 34 \\ p - 21 - 21 &= 34 - 21 \\ p &= 13 \end{aligned}$$

④ Find the difference between the 2 diagrams
 $18 - 8$



7. Identify the mistake in the problem below. Then, correct the mistake.

$$\begin{aligned} q + 18 &= 22 \\ q + 18 - 18 &= 22 + 18 \\ q &= 40 \end{aligned}$$

⑤ $\begin{array}{r} 18 \\ - 8 \\ \hline 10 \end{array}$ so $p = 10$

8. Match the equation with the correct solution on the right.

$$r + 10 = 22$$

$$r = 10$$

$$r - 15 = 5$$

$$r = 20$$

$$r - 18 = 14$$

$$r = 12$$

$$r + 5 = 15$$

$$r = 32$$

N. Fiorella

Problem Set

- Use tape diagrams to calculate the solution of $30 = 5w$. Then, check your answer.
- Solve $12 = \frac{x}{4}$ algebraically. Then, check your answer.
- Use tape diagrams to calculate the solution of $\frac{y}{5} = 15$. Then, check your answer.
- Solve $18z = 72$ algebraically. Then, check your answer.
- Write a division equation that has a solution of 8. Prove that your solution is correct by using tape diagrams.
- Write a multiplication equation that has a solution of 8. Solve the equation algebraically to prove that your solution is correct.
- When solving equations algebraically, Meghan and Meredith each got a different solution. Who is correct? Why did the other person not get the correct answer?

Meghan	Meredith
$\frac{y}{2} = 4$	$\frac{y}{2} = 4$
$\frac{y}{2} \cdot 2 = 4 \cdot 2$	$\frac{y}{2} \div 2 = 4 \div 2$
$y = 8$	$y = 2$

① Figure out what operation the original equation is representing.
 $12 = \frac{x}{4} \rightarrow$ dividing

② Solve using the opposite of dividing \rightarrow multiplication

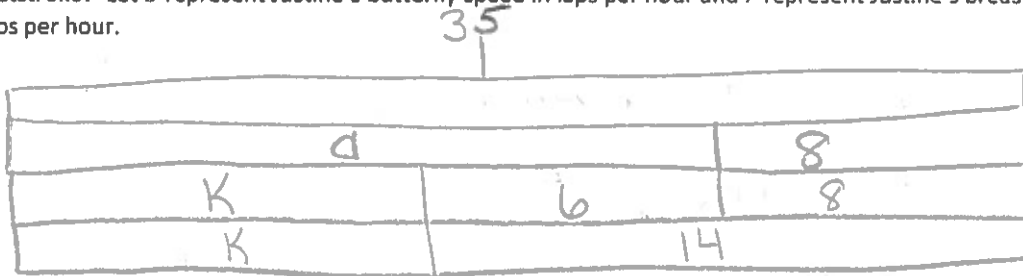
③ multiply by the number on the side of the variable (letter) to both sides
 $(4) 12 = \frac{x}{4}$
 $x = 48$

NF

Problem Set

Use tape diagrams to solve each problem.

- Dwayne scored 55 points in the last basketball game, which is 10 points more than his previous personal best. LeBron scored 15 points more than Chris in the same game. LeBron scored the same number of points as Dwayne's previous personal best. Let d represent the number of points Dwayne scored during his previous personal best and c represent the number of Chris's points.
 - How many points did Chris score during the game?
 - If these are the only three players who scored, what was the team's total number of points at the end of the game?
- The number of customers at Yummy Smoothies varies throughout the day. During the lunch rush on Saturday, there were 120 customers at Yummy Smoothies. The number of customers at Yummy Smoothies during dinner time was 10 customers fewer than the number during breakfast. The number of customers at Yummy Smoothies during lunch was 3 times more than during breakfast. How many people were at Yummy Smoothies during breakfast? How many people were at Yummy Smoothies during dinner? Let d represent the number of customers at Yummy Smoothies during dinner and b represent the number of customers at Yummy Smoothies during breakfast.
- Karter has 24 T-shirts. Karter has 8 fewer pairs of shoes than pairs of pants. If the number of T-shirts Karter has is double the number of pants he has, how many pairs of shoes does Karter have? Let p represent the number of pants Karter has and s represent the number of pairs of shoes he has.
- Darnell completed 35 push-ups in one minute, which is 8 more than his previous personal best. Mia completed 6 more push-ups than Katie. If Mia completed the same amount of push-ups as Darnell completed during his previous personal best, how many push-ups did Katie complete? Let d represent the number of push-ups Darnell completed during his previous personal best and k represent the number of push-ups Katie completed.
- Justine swims freestyle at a pace of 150 laps per hour. Justine swims breaststroke 20 laps per hour slower than she swims butterfly. If Justine's freestyle speed is three times faster than her butterfly speed, how fast does she swim breaststroke? Let b represent Justine's butterfly speed in laps per hour and r represent Justine's breaststroke speed in laps per hour.



$$d + 8 = 35$$

$$k + 6 + 8 = 35$$

$$\begin{array}{r} k + 14 = 35 \\ -14 \quad -14 \\ \hline \end{array}$$

$$k = 21$$

NF

Problem Set

Create tables to solve the problems, and then check your answers with the word problems.

1. On average, a baby uses three times the number of large diapers as small diapers and double the number of medium diapers as small diapers.
 - a. If the average baby uses 2,940 diapers, size large and small, how many of each size would be used?
 - b. Support your answer with equations.

2. Tom has three times as many pencils as pens but has a total of 100 writing utensils.
 - a. How many pencils does Tom have?
 - b. How many more pencils than pens does Tom have?

3. Serena’s mom is planning her birthday party. She bought balloons, plates, and cups. Serena’s mom bought twice as many plates as cups. The number of balloons Serena’s mom bought was half the number of cups.
 - a. If Serena’s mom bought 84 items, how many of each item did she buy?
 - b. Tammy brought 12 balloons to the party. How many total balloons were at Serena’s birthday party?
 - c. If half the plates and all but four cups were used during the party, how many plates and cups were used?

4. Elizabeth has a lot of jewelry. She has four times as many earrings as watches but half the number of necklaces as earrings. Elizabeth has the same number of necklaces as bracelets.
 - a. If Elizabeth has 117 pieces of jewelry, how many earrings does she have?
 - b. Support your answer with an equation.

5. Claudia was cooking breakfast for her entire family. She made double the amount of chocolate chip pancakes as she did regular pancakes. She only made half as many blueberry pancakes as she did regular pancakes. Claudia also knows her family loves sausage, so she made triple the amount of sausage as blueberry pancakes.
 - a. How many of each breakfast item did Claudia make if she cooked 90 items in total?
 - b. After everyone ate breakfast, there were 4 chocolate chip pancakes, 5 regular pancakes, 1 blueberry pancake, and no sausage left. How many of each item did the family eat?

6. During a basketball game, Jeremy scored triple the number of points as Donovan. Kolby scored double the number of points as Donovan.
 - a. If the three boys scored 36 points, how many points did each boy score?
 - b. Support your answer with an equation.

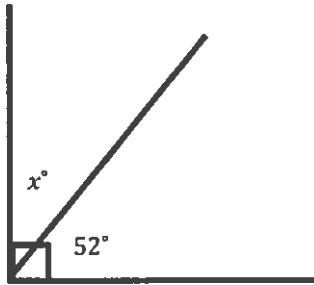
large	medium	small	Total
3	2	1	6
1,470	980	490	2,940

On average a baby uses 490 small diapers, 980 medium diapers and 1,470 large diapers.

Problem Set

Write and solve an equation for each problem.

1. Solve for x .



$$\begin{array}{r} 90 \\ - 52 \\ \hline 38 \end{array}$$

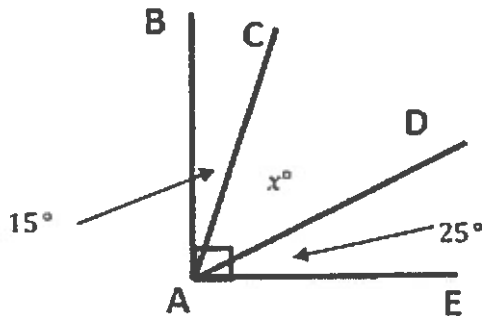
$$x^\circ + 52 = 90^\circ$$

$$x^\circ + 52^\circ - 52^\circ = 90^\circ - 52^\circ$$

$$x^\circ = 38^\circ$$

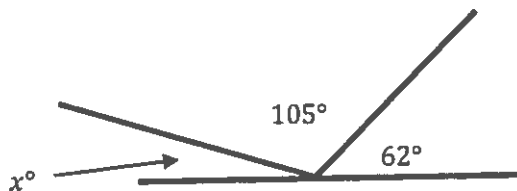
The measure of the missing angle is 38°

2. $\angle BAE$ measures 90° . Solve for x .



3. Thomas is putting in a tile floor. He needs to determine the angles that should be cut in the tiles to fit in the corner. The angle in the corner measures 90° . One piece of the tile will have a measure of 24° . Write an equation, and use it to determine the measure of the unknown angle.

4. Solve for x .



Problem Set

50

1. Jaziyah sells 3 houses each month. To determine the number of houses she can sell in any given number of months, she uses the equation $t = 3m$, where t is the total number of houses sold and m is the number of months. Name the independent and dependent variables. Then, create a table to show how many houses she sells in fewer than 6 months.

the independent variable is the number of months.

1	3
2	6
3	9
4	12
5	15

the dependent variable is the total number of houses sold.

2. Joshua spends 25 minutes of each day reading. Let d be the number of days that he reads, and let m represent the total minutes of reading. Determine which variable is independent and which is dependent. Then, write an equation that models the situation. Make a table showing the number of minutes spent reading over 7 days.

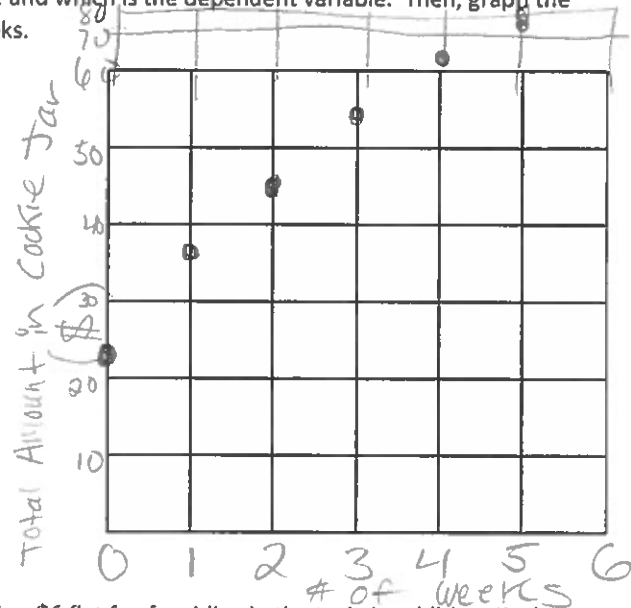
3. Each package of hot dog buns contains 8 buns. Let p be the number of packages of hot dog buns and b be the total number of buns. Determine which variable is independent and which is dependent. Then, write an equation that models the situation, and make a table showing the number of hot dog buns in 3 to 8 packages.

Problem Set

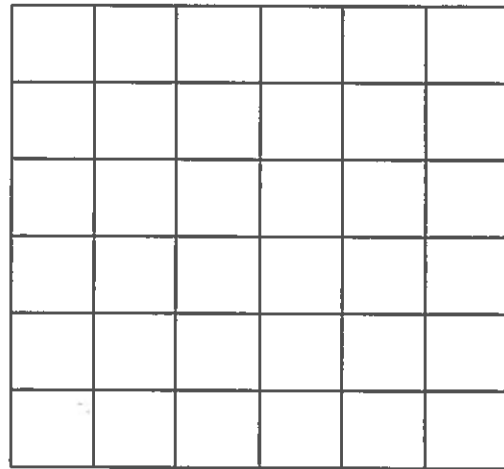
(30)

1. Caleb started saving money in a cookie jar. He started with \$25. He adds \$10 to the cookie jar each week. Write an equation where w is the number of weeks Caleb saves his money and t is the total amount in dollars in the cookie jar. Determine which variable is the independent variable and which is the dependent variable. Then, graph the total amount in the cookie jar for w being less than 6 weeks.

# of Weeks	Total Amount in Cookie Jar \$
0	25
1	35
2	45
3	55
4	65
5	75



2. Kevin is taking a taxi from the airport to his home. There is a \$6 flat fee for riding in the taxi. In addition, Kevin must also pay \$1 per mile. Write an equation where m is the number of miles and t is the total cost in dollars of the taxi ride. Determine which variable is independent and which is dependent. Then, graph the total cost for m being less than 6 miles.



Problem Set

Choose the number(s), if any, that make the equation or inequality true from the following set of numbers:

{0, 3, 4, 5, 9, 13, 18, 24}.

1. $h - 8 = 5$

2. $h - 8 < 5$

3. $4g = 36$

4. $4g \geq 36$

5. $\frac{1}{4}y = 7$

6. $\frac{1}{4}y > 7$

7. $m - 3 = 10$

SC 8. $n - 3 \leq 10$

$$m = 0, 3, 4, 5, 9, 13$$

$$0 - 3 \leq 10$$

$$3 - 3 \leq 10$$

$$4 - 3 \leq 10$$

$$5 - 3 \leq 10$$

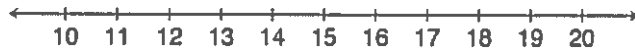
$$9 - 3 \leq 10$$

$$13 - 3 \leq 10$$

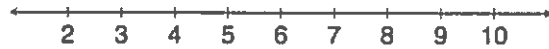
Problem Set

Write and graph an inequality for each problem.

1. At least 13



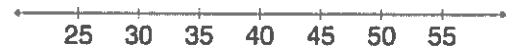
2. Less than 7



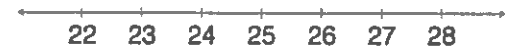
3. Chad will need at least 24 minutes to complete the 5K race. However, he wants to finish in under 30 minutes.



4. Eva saves \$60 each week. Since she needs to save at least \$2,400 to go on a trip to Europe, she will need to save for at least 40 weeks.



5. Clara has \$100. She wants to buy 4 pairs of the same pants. Due to tax, Clara can afford pants that are less than \$25.



6. A gym charges \$30 per month plus \$4 extra to swim in the pool for an hour. Because a member has just \$50 to spend at the gym each month, the member can swim at most 5 hours.

SC

$$0 \leq x \leq 5$$



* The member can swim in the pool for 5 hours.

* The total amount of time the member spends in the pool must be greater than or equal to 0 hours because the member may choose not to swim.