4th Quarter

Mad Minute Averages

Name First Last Date 3-20-17

wk of 3-20	wk of 3-27	wk of 4-4	
Mon. 34=85%	Mon. 35=88%	Mon. Iowa Test	Mon.
Tues. 36=90%	Tues. 36=90%	Tues. 32=80%	Tues.
Wed. 38=95%	Wed. 33=83%	Wed. 31=78%	Wed.
Thurs. 40=100%	Thurs. Ch 9 Quiz	Thurs. 33=83%	Thurs.
Fri. Ch 9 Quiz	Fri. 32=80%	Fri.	Fri.

Mon.	Mon.	Mon.	Mon.
Tues.	Tues.	Tues.	Tues.
Wed.	Wed.	Wed.	Wed.
Thurs.	Thurs.	Thurs.	Thurs.
Fri.	Fri.	Fri.	Fri.

Mon.	Tues.	Wed.	Thurs.	Fri.
Mon.	Tues.	Wed.	Thurs.	Fri.

Week	Average	Parent Signature	Week	Average	Parent Signature
× one	37=93%		six		
÷ two	34=85%		seven		
mixed three			eight		
four			nine		
five			ten		

NAME _____ DATE _____ PERIOD ____

9-1 Study Guide and Intervention

Properties

The Distributive Property
To multiply a sum by a number, multiply each addend of the sum by the number outside the parentheses.
$2(3 + 4) = 2 \times 3 + 2 \times 4$ $(4 + 5)2 = 4 \times 2 + 5 \times 2$

Commutative Properties of Addition and Multiplication
The order in which numbers are added or multiplied does not change the sum or product.
$2 + 3 = 3 + 2$ $4 \times 5 = 5 \times 4$

Associative Properties of Addition and Multiplication
The way in which numbers are grouped when added or multiplied does not change the sum or product.
$(2 + 3) + 4 = 2 + (3 + 4)$ $(5 \times 6) \times 2 = 5 \times (6 \times 2)$

Additive Identity
The sum of any number and 0 is the number.
$5 + 0 = 5$ $a + 0 = a$

Multiplicative Identity
The product of any number and 1 is the number.
$7 \times 1 = 7$ $1 \times n = n$

You can use the Distributive, Commutative, and Associative Properties to make your calculations easier to do mentally.

EXAMPLE 1 Find 5×32 mentally using the Distributive Property.

$5 \times 32 = 5(30 + 2)$ Write 32 as 30 + 2.
$= 5(30) + 5(2)$ Distributive Property
$= 150 + 10$ Multiply 5 and 30 mentally. Multiply 5 and 2 mentally.
$= 160$ Add 150 and 10 mentally.

So, $5 \times 32 = 160$.

EXAMPLE 2 Find $12 + 27 + 18$ mentally.

- You can add 12 and 18. So, change the order of the numbers to be added.
  $12 + 27 + 18 = 12 + 18 + 27$ Commutative Property
- Now group the numbers using the Associative Property. The parentheses tell you what to do first.
  $12 + 18 + 27 = (12 + 18) + 27$ Associative Property
  $= 30 + 27$ Add 12 and 18 mentally.
  $= 57$ Add 30 and 27 mentally.

EXERCISES

Find each product mentally. Use the Distributive Property.
1. 5×42 2. 2×55 3. 3×84

Rewrite each expression using the Distributive Property. Then evaluate the expression.
4. $2(10 + 3)$ see notes 5. $(30 + 4)5$ 6. $11(10 + 2)$

Find each sum or product mentally.
7. $55 + 16 + 5$ 8. $17 + 21 + 13$ 9. $5 \times 18 \times 2$

Lesson 9-1

$3(80 + 4)$
$3(80) + 3(4)$
$240 + 12$
252
$84 \times 3 = 252$

$(55 + 5) + 16$
$60 + 16$
76

$(17 + 13) + 21$
$30 + 21$
51

4) $2(10+3)$

$2(10) + 2(3)$

$20 + 6$

26

$2(10+3)$

$2(13)$

26

NAME _____ DATE _____ PERIOD ____

9-1 Practice: Word Problems

Properties

1. **HOMEWORK** Jacy spends half an hour every night studying math and an hour every night studying science. Over five days, how much time does Jacy spend on his homework? Write two expressions you can use to find the answer. Then answer the question.

2. **COMPUTER GAMES** In Carlota's computer game, she goes up one level every time she earns 210 points. Carlota has just gone up a level for the eighth time. Use the Distributive Property to calculate mentally how many points Carlota has.

3. **ENROLLMENT** The sixth grade class at Parkview Middle School has 25 blondes, 18 redheads, and 25 brunettes. Use mental math to figure out how many students are in the sixth grade.

$25+18+25$ $(25+25)+18$ $50 + 18 \rightarrow 68$

At Parkview Middle School there are a total of 68 6th grade students.

4. **GYM CLASS** In gym class, students were put into groups. Each group had 4 boys and 3 girls. If 7 groups were formed, how many students were in the class?

5. **SPORTS CARS** Every day for 11 days, Tylia saw 23 sports cars pass her bedroom window. Write a numerical expression to describe how many sports cars she saw in all. Rewrite the expression using the Distributive Property so that you can mentally calculate how many sports cars she saw.

6. **MARBLES** Devon has 16 blue marbles, 22 green marbles, and 14 red marbles in a bag. Write a numerical expression to describe the total number of marbles in the bag in the order given in the problem. Then rewrite the expression to make it easier to mentally calculate how many marbles are in the bag.

7. **BOWLING** It costs $5.75 per person for one game of bowling and $2.25 to rent one pair of shoes. What does it cost for five friends to go bowling? Write two different numerical expressions to describe the cost for five friends. Then use one to calculate the total cost for five friends.

8. **GIFTS** Ms. Bautista made 22 gift baskets for her students. Each basket had 5 apples and 3 oranges. How many pieces of fruit did Ms. Bautista use?

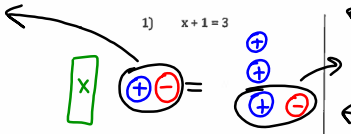
Lesson 9–1

Name: _____ Date: _____

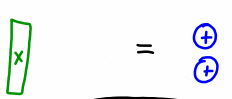
Addition Equations

Solve each equation using models (pictures) of algebra tiles.

1) $x + 1 = 3$

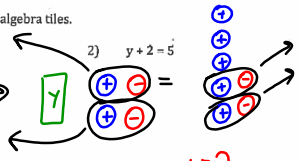


$+-1 = +-1$

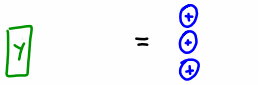


$x = +2$

2) $y + 2 = 5$



$+-2 = +-2$

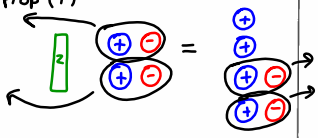


$y = +3$

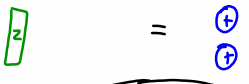
3) $2 + z = 4$

Commutative Prop (+)

$z + 2 = 4$



$+-2 = +-2$

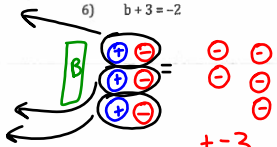


$z = +2$

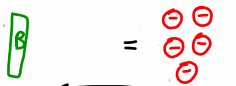
4) $4 = v + 3$

5) $p + 2 = -1$

6) $b + 3 = -2$



$+-3 = +-3$



$B = -5$

7) $4 + m = -3$

8) $-5 = t + 1$

NAME _____ DATE _____ PERIOD ____

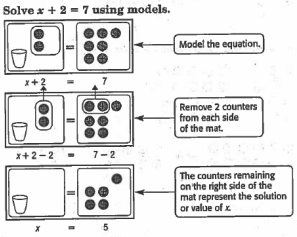
9-2 **Study Guide and Intervention**

Solving Addition Equations

Subtraction Property of Equality If you subtract the same number from each side of an equation, the two sides remain equal.

$$\begin{array}{r} 5 = 5 \\ -3 = -3 \\ \hline 2 = 2 \end{array}$$

EXAMPLE 1 Solve $x + 2 = 7$ using models.



The solution is 5. $5 + 2 = 7$ ✓
5 substituted in the original equation is correct.

EXAMPLE 2 Solve $b + 3 = 2$.

$$\begin{array}{rl} b + 3 = & 2 \quad \text{Write the equation.} \\ -3 = & -3 \quad \text{Subtract 3 from each side to undo the addition of 3 on the left.} \\ \hline b + 0 = & -1 \quad \text{Simplify.} \\ b = & -1 \end{array}$$

The solution is -1.

Check
$b + 3 = 2$ Write the original equation.
$-1 + 3 \stackrel{?}{=} 2$ Replace b with -1.
$2 = 2$ ✓ This sentence is true.

EXERCISES

Solve each equation. Use models if necessary. Check your solution.

1. $a + 1 = 7$ see notes
2. $3 + b = 8$
3. $c + 7 = 4$
4. $9 = x + 4$
5. $g + 8 = -2$
6. $d + 6 = -5$ $+^{-}6 = +^{-}6$

$d = -11$

check

$d + 6 = -5$

$(-11) + 6 \stackrel{?}{=} -5$

$-5 = -5$ ✓

1) $A + 1 = +7$

$+^{-}1 = +^{-}1$

$A = +6$

check

$A + 1 = 7$

$(+6) + 1 \stackrel{?}{=} 7$

$7 = 7$ ✓

NAME _____ DATE _____ PERIOD ____

9-2 Practice: Word Problems

Solving Addition Equations

1. **BIRTHDAYS** Alberto's birthday is 7 days after Corey's birthday. Alberto's birthday is on the 9th. Write and solve an equation to find the day of Corey's birthday.

2. **AGE** Jason and Megan are brother and sister. Jason is 4 years older than Megan. If Jason is 16 years old, write and solve an equation to find Megan's age.

3. **PAPER AIRPLANES** Rebecca and Ricardo are both testing their paper airplanes. Rebecca's plane flew 6 feet further than Ricardo's plane. If Rebecca's plane flew 10 feet, write and solve an equation to find how far Ricardo's plane flew.

4. **BASEBALL CARDS** Ren and Chet have just started collecting baseball cards. Ren has 13 more baseball cards than Chet. Ren has 27 cards. Write and solve an equation to find how many baseball cards Chet has.

5. **SKATING** Susan and Ruby went skating. Ruby skated 30 minutes longer than Susan. If Ruby skated for 45 minutes, write and solve an equation to find how long Susan skated.

6. **STUNT FLYER** A stunt airplane is flying at 150 feet. It ascends to 325 feet. Write and solve an equation to find the change in altitude of the airplane.

7. **SAVINGS** Oscar is saving money to buy a jacket that costs $47. He has already saved $25. Write and solve an equation to find how much more money Oscar needs to save.

8. **RECYCLING** Bonnie has 27 more cans than Jackie. If she has 56 cans, write and solve an equation to find how many cans Jackie has.

Name: _____ Date: _____

"add the opposite"

Subtraction Equations

Solve each equation using models (pictures) of algebra tiles.

1) $x + 4 = 5$

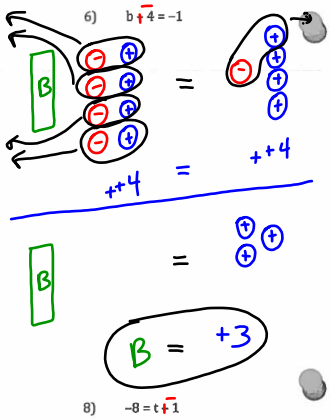
2) $y + 2 = 1$

3) $3 = h + 1$

4) $6 = k + 7$

5) $x - 5 = -6$

6) $b - 4 = -1$



7) $-5 = p - 2$

8) $-8 = t - 1$

2

NAME _____ DATE _____ PERIOD ____

9-3

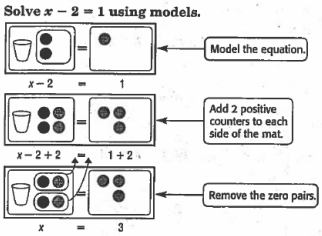
Study Guide and Intervention

Solving Subtraction Equations

Addition Property of Equality If you add the same number to each side of an equation, the two sides remain equal.

$$\begin{array}{r} 5 = 5 \\ +3 = +3 \\ \hline 8 = 8 \end{array}$$

EXAMPLE 1 Solve $x - 2 = 1$ using models.



The solution is 3.

EXAMPLE 2 Solve $b - 3 = -5$.

$b - 3 = -2$	Write the equation.
$+ 3 = +3$	Add 3 from each side to undo the addition of 3 on the left.
$b + 0 = -2$	Simplify.
$b = -2$	

Check

$b - 3 = -5$	Write the original equation.
$-2 - 3 \stackrel{?}{=} -5$	Replace b with -2.
$-5 = -5$ ✓	This sentence is true.

EXERCISES

Solve each equation. Use models if necessary. Check your solution.

1. $a + 2 = 3$
2. $b + 1 = 7$
3. $c + 4 = 4$
4. $-2 = x + 4$
5. $z + 6 = -3$
6. $g + 3 = -4$
7. $-9 + w = 1$ see notes
8. $v + 8 = 5$
9. $-7 = y + 5$
10. $u + 3 = -4$
11. $-2 = t + 9$
12. $f + 6 = -3$

$+6 = +6$

$f = +3$

Lesson 9-3

7) $-9 + w = +1$

$w + -9 = +1$

$++9 = ++9$

$w = +10$

$w = +10$

NAME _____ DATE _____ PERIOD ____

9-3

Practice: Word Problems

Solving Subtraction Equations

1. **BIRDS** A house cat, Sophie, scared away 5 birds when she arrived on the porch. If 3 birds remain, write and solve an equation to find how many birds were on the porch before Sophie arrived.

2. **APPLES** David brought apples to school one day. After giving one to each of his 5 closest friends, David had 6 apples left. Write and solve an equation to find how many apples David brought to school.

3. **BASKETBALL** The basketball team is practicing after school. Four students have to leave early. If 12 basketball players remain, write and solve an equation to find how many students are on the basketball team.

4. **MARBLES** Virginia's mother gave her marbles for her birthday. Virginia lost 13 of them. If she has 24 marbles left, write and solve an equation to find how many her mother gave her.

5. **MONEY** Claudio went for a walk. While he was walking $1.35 fell out of his pocket. When he returned home, he counted his money and had $2.55 left. Write and solve an equation to find how much money was in Claudio's pocket when he started his walk.

C $+ -1.35 = +2.55$

$++1.35 = ++1.35$

6. **HANG GLIDING** Aida was hang gliding. After losing 35 feet in altitude, she was gliding at 125 feet. Write and solve an equation to find her height when she started hang gliding.

7. **SHARKS** The average great hammerhead shark is 11.5 feet long. The average great hammerhead shark is 13.5 feet shorter than the average whale shark. Write and solve an equation to find the length of the average whale shark.

8. **JOKES** At a party, Tex told 17 fewer knock-knock jokes than he did riddles. If he told 23 knock-knock jokes, write and solve an equation to find how many riddles Tex told at the party.

Lesson 9-3

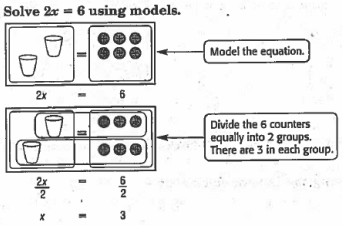
NAME _____ DATE _____ PERIOD ____

9-4 Study Guide and Intervention

Solving Multiplication Equations

In a multiplication equation, the number by which a variable is multiplied is called the **coefficient**. In the multiplication equation, $2x = 8$, the coefficient is 2.

EXAMPLE 1 Solve $2x = 6$ using models.



Check
$2x = 6$ Write the original equation.
$2(3) \stackrel{?}{=} 6$ Replace x with 3.
$6 = 6$ This sentence is true. ✓

The solution is 3.

EXAMPLE 2 Solve $-4b = 12$.

$-4b = 12$ Write the equation.
$\frac{-4b}{-4} = \frac{12}{-4}$ Divide each side by -4 to get a single positive variable by itself.
$1b = -3$ Simplify.
$b = -3$

Check
$-4b = 12$ Write the original equation.
$-4(-3) \stackrel{?}{=} 12$ Replace b with -3.
$12 = 12$ This sentence is true. ✓

The solution is -3.

EXERCISES

Solve each equation. Use models if necessary. Check your solution.

1. $\frac{5a}{5} = \frac{25}{5}$ A = 5
2. $7c = 49$
3. $\frac{24}{6} = \frac{6d}{6}$ 4 = d, d = 4
4. $2x = -8$
5. $\frac{18}{-9} = \frac{-9y}{-9}$ y = −2
6. $-8g = -16$
7. $18 = -3z$
8. $\frac{-4w}{-4} = \frac{-36}{-4}$ w = +9
9. $56 = 7v$
10. $24 = -8f$
11. $3u = -27$
12. $-42 = 6t$

NAME _____ DATE _____ PERIOD ____

9-4 Practice: Word Problems

Solving Multiplication Equations

1. **BAND SOLO** Kai's solo in the next school band performance is 4 times as long as Dena's solo. Kai's solo is 12 minutes long. Write and solve an equation to find the length of Dena's solo.

2. **CATS** Steve's tabby cat eats 5 times as often as his black cat. The tabby eat ate 10 times yesterday. Write and solve an equation to find how many times the black cat ate.
$t = 5 \cdot b$
$\frac{(10)}{5} = \frac{5b}{5}$
$2 = b$
Steve's black cat ate 2 times yesterday.

3. **FOOTBALL** In last night's football game, the home team earned 3 times as many points as the visiting team. They won the game with 21 points. Write and solve an equation to find how many points the visiting team had.

4. **MONEY** Paz has 3 times as much money in her wallet as in her pocket. There is $18 in her wallet. Write and solve an equation to find how much money is in her pocket.
$w = 3 \cdot p$
$\frac{18}{3} = \frac{3p}{3}$
$6 = p$
Paz has $6 in her pocket.

5. **MORNINGS** It takes Jun 3 times as long as it takes Kendra to get ready in the morning. It takes Jun 45 minutes to get ready. Write and solve an equation to find how long it takes Kendra.

6. **FISH** In his home aquarium, Enli has 12 times as many guppies as he has goldfish. Enli just counted 72 guppies. Write and solve an equation to find how many goldfish he has.

7. **MUSIC** Ray's favorite song is 2 times longer than Meli's favorite song. Write and solve an equation to find the length of Meli's favorite song if Ray's lasts 6 minutes.

8. **TRAILS** The forest trail to Round Lake is 3 times longer than the rocky trail to Round Lake. The forest trail is 15 miles long. Write and solve an equation to find the length of the rocky trail.

NAME _____ DATE _____ PERIOD ____

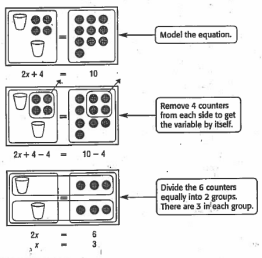
9-5 Study Guide and Intervention

Solving Two-Step Equations

Lesson 9-5

Equations that have two different operations are called **two-step equations.** You can work backward using the reverse of the order of operations to solve a two-step equation.

EXAMPLE 1 Solve $2x + 4 = 10$ using models.



EXAMPLE 2 Solve $-3z - 4 = 8$. Check your solution.

$-3z - 4 = 8$	Write the equation.	**Check** $-3z - 4 = 8$	Write the original equation.
$+4 = +4$	Add 4 to each side.	$-3(-4) - 4 \stackrel{?}{=} 8$	Replace z with -4.
$-3z = 12$	Simplify.	$12 - 4 \stackrel{?}{=} 8$	Multiply.
$\frac{-3z}{-3} = \frac{12}{-3}$	Divide each side by -3.	$8 = 8$ ✓	Simplify.
$z = -4$	Simplify.		

The solution is -4.

EXERCISES

Solve each equation. Use models if necessary.

1. $4m + 5 = 9$ see notes
2. $3n + 4 = -2$
3. $3 = 2s - 5$
4. $5 = -7 + 4b$
5. $6a - 5 = 7$
6. $-13 + 3c = 8$
7. One more than four times a number is thirteen. What is the number? $4 \cdot d = 13$ see notes
8. Three is seven less than two times a number. What is the number? $3 = 7 = 2 \cdot b$

"is" → =
"more than" → +
"times" → ×

$+3 = 2b + 7$
$+7 \quad +7$
$+10 = 2b$
$\frac{+10}{2} = \frac{2b}{2}$
$+5 = b$
$b = +5$

P
E
M ✓
D
A ✓
S
start

1) $4n + 5 = +9$
$+ -5 \quad = + -5$
$\frac{4n}{4} = \frac{+4}{4}$
$n = +1$

P
E
M ✓
D
A ✓
S
Start

7) $-1 + 4 \cdot d = +13$

$+ -1 \quad = +-1$

$\frac{4d}{4} = \frac{+12}{4}$

$d = +3$

PEMDAS ✓ ✓

Start

NAME _____ DATE _____ PERIOD ____

9-5

Practice: Word Problems

Solving Two-Step Equations

Lesson 9-5

1. **FIRE TRUCKS** Fire Station A has one more than twice as many fire trucks as Fire Station B. If Fire Station A has three fire trucks, write and solve an equation to find how many fire trucks Fire Station B has.

$A = 1 + 2 \cdot B$

$3 = 1 + 2 \cdot B$ see notes

2. **TOY CARS** Tanisha has 7 less than 4 times as many toy cars as Fernando. If Tanisha has 9 cars, write and solve an equation to find how many toy cars Fernando has.

3. **ADDRESS** Danielle and Erin live on the same street. Danielle lives at number 13. If Danielle's house number is 5 less than 3 times Erin's house number, write and solve an equation to find Erin's house number.

4. **BIRTHDAY CAKE** Mrs. Zeng is slicing her son's birthday cake. To make sure everyone will have enough, she slices the cake so that the number of slices is 6 more than twice the number of people at the party. If she slices the cake into 20 slices, write and solve an equation to find how many people are at the party.

$20 = 6 + 2 \cdot p$ see notes

5. **DINOSAURS** The largest complete dinosaur we know of was a Brachiosaurus. It reached a length of 23 meters. Its length was one less than twice its height. Write and solve an equation to find the height of the Brachiosaurus.

6. **BABY-SITTING** Last week, Enrique earned $30.00 baby-sitting. Enrique earned $5.00 less than 7 times what Rhea earned. Write and solve an equation to find how much money Rhea earned baby-sitting last week.

7. **ELECTION** Raj received 8 more than 3 times as many votes as Vinny in a school election. Raj received 44 votes. Write and solve an equation to find how many votes Vinny received.

"fewer"

flip order

8. **JACK-O-LANTERN** It took Suki 127 minutes from start to finish to carve her pumpkin. Carving the pumpkin took her 10 more minutes than 10 times as long as it took her to pick the pumpkin out at the pumpkin patch. Write and solve an equation to find how long it took Suki to pick out her pumpkin.

$127 = 10 \cdot p + 13$

1) $+3 = 1 + 2B$

$+-1 = +-1$

$+2 = 2B$

$\frac{+2}{2} = \frac{2B}{2}$

$1 = B$

$B = 1$

PEMDAS

Start

Fire Station B has 1 fire truck.

4) $+20 = +6 + 2p$

$+-6 = +-6$

$+14 = 2p$

$\frac{+14}{2} = \frac{2p}{2}$

$7 = p$

PEMDAS

Start

There are 7 people at Mrs. Zeng's son's birthday party.

NAME _____ DATE _____ PERIOD ____

9-6

Study Guide and Intervention

Functions

A **function rule** describes the relationship between the input and output of a **function**. The inputs and outputs can be organized in a **function table**.

EXAMPLE 1 Complete the function table.

Input (n)	Output
9	■
8	■
6	■

$9-7=2$, $8-7=1$, $6-7=-1$

The function rule is $n - 7$. Subtract 7 from each input.

Input		Output
9	$-7\rightarrow$	2
8	$-7\rightarrow$	1
6	$-7\rightarrow$	−2

→

Input (n)	Output
9	2
8	1
6	−1

EXAMPLE 2 Find the rule for the function table.

Input (n)	Output
−3	−12
1	4
2	8

-3×4, 1×4, 2×4

Study the relationship between each input and output.

Input		Output
−3	$\times 4\rightarrow$	−12
1	$\times 4\rightarrow$	4
2	$\times 4\rightarrow$	8

The output is four times the input. So, the function rule is $4x$.

EXERCISES

Complete each function table.

1.

Input (n)	Output
−1	−2
2	4
4	8

$\times 2$

2.

Input (n)	Output
−3	1
1	5
4	8

$4+x$

Find the rule for each function table.

3.

Input (n)	Output
−4	−2
2	4
5	7

$+2$

$n+2$

4.

Input (n)	Output
−4	−2
2	1
6	3

$\div 2$

$n \div 2$ or $\frac{n}{2}$

NAME _____ DATE _____ PERIOD ____

9-6

Practice: Word Problems

Functions

1. **DRAGONS** The Luck Dragons that live in the Enchanted Forest weigh $4x$ pounds when they are x years old. Write a function table that can be used to find the weights of 6-year old, 8-year old, and 10-year old Luck Dragons.

2. **ROLLER COASTER** Twelve people are able to ride the Serpent of Fire roller coaster at one time. Write a function table that shows the total number of people that have been on the roller coaster after 1, 2, 3, and 4 rides.

# rides	total people
1 ×12	12
2 ×12	24
3 ×12	36
4 ×12	48

3. **MOVIES** At the local movie theater it costs $10.00 for 2 students to see a movie. It costs $15.00 for 3 students, and it costs $20.00 for 4 students. Let the number of students be the input. What is the function rule that relates the number of students to the cost of tickets?

students	$ cost
2 ×5	$10
3 ×5	$15
4 ×5	$20

$5n$

4. **HOMEWORK** At Elmwood Middle School, sixth graders spend 1 hour every night doing homework, seventh graders spend 2 hours, and eighth graders spend 3 hours. Let the students' grade be the input. What is the function rule between the students' grade and the amount of time the students spend on homework every night?

$n-5$

The grade level minus 5 will give the hours of homework each day.

grade	HW hr
6	1
7	2
8	3

5. **BEADS** A bead shop sells wooden beads for $3 each and glass beads for $7 each. Write a function rule to represent the total selling price of wooden (w) and glass (g) beads.

Total price

$3 \cdot w + 7 \cdot g$ is the function rule to represent the total selling price of the beads.

6. Use the function rule in Exercise 5 to find the selling price of 20 wooden beads and 4 glass beads.

$3w + 7g$

$3(20) + 7(4)$

$60 + 28$

$88 is the selling price of the 20 wooden beads and 4 glass beads.

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9-7 Study Guide and Intervention

Graphing Functions

EXAMPLE 1 Make a function table for the rule $y = x + 2$. Use input values of -2, 0, and 2. Then graph the function.

Step 1 Record the input and output in a function table. List the input and output as ordered pairs.

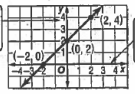
Step 2 Graph the ordered pairs on the coordinate plane.

Step 3 The points appear to lie on a line. Draw the line that contains these points. The line is the graph of $y = x + 2$.

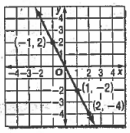
Input (x)	Function Rule ($x + 2$)	Output (y)	Ordered Pairs (x, y)
-2	$-2 + 2$	0	$(-2, 0)$
0	$0 + 2$	2	$(0, 2)$
2	$2 + 2$	4	$(2, 4)$

The y-coordinates represent the output values.

The x-coordinates represent the output values.



EXAMPLE 2 Make a function table for the graph. Then determine the function rule.



-1	2	$(-1, 2)$
1	-2	$(1, -2)$
2	-4	$(2, -4)$

Input		Output
-1	$\times(-2)$	2
1	$\times(-2)$	-2
2	$\times(-2)$	-4

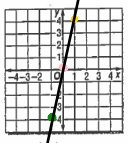
-2 is multiplied by each input to get the output.
The function rule is $y = -2x$.

EXERCISES

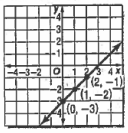
1. Complete the function table. Then graph the function.

x	$4n$
-1	(4) -4
0	(4) 0
1	(4) 4

$(-1, -4)$ ✓
$(0, 0)$ ✓
$(1, 4)$ ✓



2. Make a function table for the graph. Then determine the function rule.



x	y
$2 + -3$	-1
$1 + -3$	-2
$0 + -3$	-3

or $-3 + n$

$n + -3$

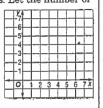
Lesson 9-7

NAME _____ DATE _____ PERIOD ____

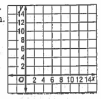
9-7 Practice: Word Problems

Graphing Functions

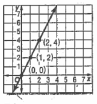
1. **LIBRARY** Tin visited the library 3 times. The first time, she spent 1 hour and checked out 4 books. Then she spent 2 hours and checked out 5 books. On her last visit, she spent 3 hours and checked out 6 books. Let the number of hours be the input and the number of books be the output. Graph the function.



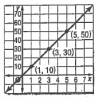
2. **CD RACK** A CD rack fits 3 CDs across. When one shelf is full, the shelf has 3 CDs on it. When two shelves are full, it has 6 CDs, and when three shelves are full it has 9 CDs. Let the number of full shelves be the input and the number of CDs be the output. Graph the function.



3. **TELEPHONE** Althea made a graph of how many friends call her after school. She let the number of hours that passed be the input and the number of people who called be the output. Look at her graph and determine the function rule.

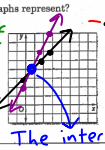


4. **DOLPHINS** The more dolphins Toni uses in the dolphin show, the more people attend the show. She let the number of dolphins be the input and the number of attendees be the output, and made a graph of the function. Look at her graph and determine the function rule.



5. **BOTANY** Jessie planted a bean plant that was 2 inches tall. Each day it grew 1 inch. Tanya planted a bean plant that was 1 inch tall. It grew 2 inches per day. Write the function rule for each bean plant.

6. **BOTANY** Graph each function from Exercise 5 on the same coordinate plane. What does the intersection of the two graphs represent?



Jessie

day	height (in)
0 + 2	(0, 2)
1 + 2	(1, 3)
2 + 2	(2, 4)
3 + 2	(3, 5)

$d + 2$

Tanya

day	height
0 + 1	1
1 + 2	3
2 + 2	5
3 + 2	7

$2 \cdot d + 1$

diff

The intersection of the graphs represents the point in time that the heights of Jessie's and Tanya's plants measure the same height.

Lesson 9-7