

Grade 7/8 to Grade Alg I Summer Math Packet

Packet due: The 3rd full day of school

Dear Riverside Students and Parents,

Following an eventful and tumultuous last school year, I know most are looking forward to a stress free summer. I encourage students to practice math by completing this summer packet or completing the listed ixls for the grade levels to keep those skills fresh. These assignments will focus on some of the skills and concepts necessary for success in your grade as well as sharpen skills you have already learned.

Please complete the packet in pencil and make sure your handwriting is legible. If you choose to do the IXL, it's the same criteria we followed during the school year. (20 mins or 80%) Do not use a calculator because you will not be allowed to use one in class. If you are stuck on a problem, I've listed some websites below that may be helpful.

Have a fun and safe summer and I look forward to seeing you in August!!!

HELPFUL APP:

"Virtual Nerd Mobile"

Requirements: IOS 3.0 or later; compatible with iPhone, iPad, and iPod Touch

Features: Virtual Nerd's on-screen instructors provide clear and approachable explanations; students can mark "favorite" videos so that they can instantly return to them in the future.

Price: Free

HELPFUL WEBSITES:

<http://www.khanacademy.org/>

<http://www.aplusmath.com>

<http://funbrain.com>

<http://aaamath.com>

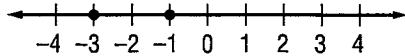
<http://math.com>

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3-2**Study Guide and Intervention****Comparing and Ordering Integers**

When two numbers are graphed on a number line, the number to the left is always less than ($<$) the number to the right. The number to the right is always greater than ($>$) the number to the left.

Model**Words**

-3 is less than -1 . -1 is greater than -3 .

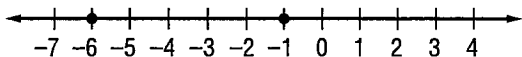
Symbols

$-3 < -1$ $-1 > -3$

The symbol points to the lesser number.

EXAMPLE 1 Replace the \bullet with $<$ or $>$ to make $-1 \bullet -6$ a true sentence.

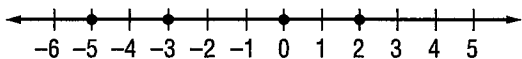
Graph each integer on a number line.



Since -1 is to the right of -6 , $-1 > -6$.

EXAMPLE 2 Order the integers 2, -3 , 0, -5 from least to greatest.

To order the integers, graph them on a number line.



Order the integers by reading from left to right: -5 , -3 , 0, 2.

EXERCISES

1. Replace the \bullet with $<$ or $>$ to make $-5 \bullet -10$ a true sentence.
2. Order -1 , 5, -3 , and 2 from least to greatest.
3. Order 0, -4 , -2 , and 7 from greatest to least.
4. Order -3 , $|-2|$, 4, 0, and -5 from greatest to least.

Study Guide and Intervention

The Coordinate Plane

The **coordinate plane** is used to locate points. The horizontal number line is the **x-axis**. The vertical number line is the **y-axis**. Their intersection is the **origin**.

Points are located using **ordered pairs**. The first number in an ordered pair is the **x-coordinate**; the second number is the **y-coordinate**.

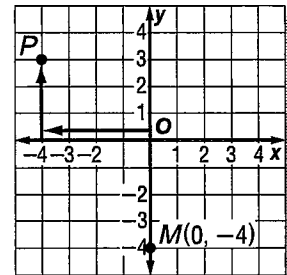
The coordinate plane is separated into four sections called **quadrants**.

EXAMPLE 1 Name the ordered pair for point P. Then identify the quadrant in which P lies.

- Start at the origin.
- Move 4 units left along the x -axis.
- Move 3 units up on the y -axis.

The ordered pair for point P is $(-4, 3)$.

P is in the upper left quadrant or quadrant II.



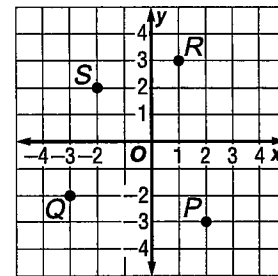
EXAMPLE 2 Graph and label the point $M(0, -4)$.

- Start at the origin.
- Move 0 units along the x -axis.
- Move 4 units down on the y -axis.
- Draw a dot and label it $M(0, -4)$.

EXERCISES

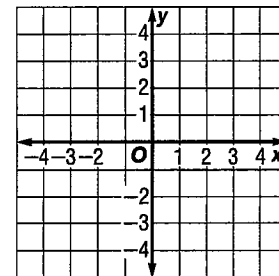
Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.

1. P
2. Q
3. R
4. S



Graph and label each point on the coordinate plane.

5. $A(-1, 1)$
6. $B(0, -3)$
7. $C(3, 2)$
8. $D(-3, -1)$
9. $E(1, -2)$
10. $F(1, 3)$



3-4**Study Guide and Intervention*****Adding Integers***

For integers with the same sign:

- the sum of two positive integers is positive.
- the sum of two negative integers is negative.

For integers with different signs, subtract their absolute values. The sum is:

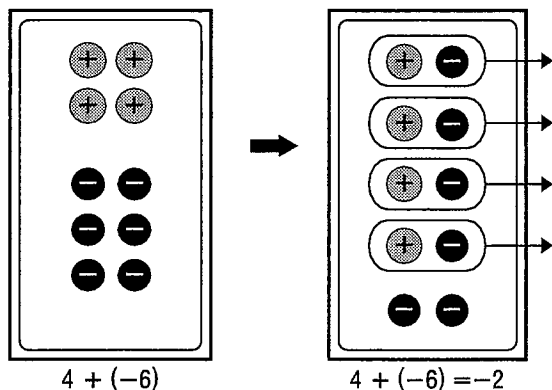
- positive if the positive integer has the greater absolute value.
- negative if the negative integer has the greater absolute value.

To add integers, it is helpful to use counters or a number line.

EXAMPLE 1 Find $4 + (-6)$.

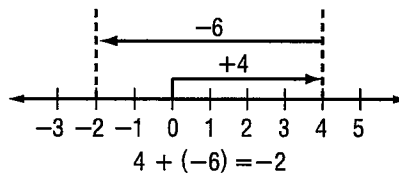
Method 1 Use counters.

Combine a set of 4 positive counters and a set of 6 negative counters on a mat.



Method 2 Use a number line.

- Start at 0.
- Move 4 units right.
- Then move 6 units left.

**EXERCISES**

Add.

1. $-5 + (-2)$

2. $8 + 1$

3. $-7 + 10$

4. $16 + (-11)$

5. $-22 + (-7)$

6. $-50 + 50$

7. $-10 + (-10)$

8. $100 + (-25)$

9. $-35 + -20$

Evaluate each expression if $a = 8$, $b = -8$, and $c = 4$.

10. $a + 15$

11. $b + (-9)$

12. $a + b$

13. $b + c$

14. $-10 + c$

15. $12 + b$

3-5**Study Guide and Intervention*****Subtracting Integers***

To subtract an integer, add its opposite.

EXAMPLE 1 Find $6 - 9$.

$$\begin{aligned} 6 - 9 &= 6 + (-9) \\ &= -3 \end{aligned}$$

To subtract 9, add -9 .
Simplify.

EXAMPLE 2 Find $-10 - (-12)$.

$$\begin{aligned} -10 - (-12) &= -10 + 12 \\ &= 2 \end{aligned}$$

To subtract -12 , add 12.
Simplify.

EXAMPLE 3 Evaluate $a - b$ if $a = -3$ and $b = 7$.

$$\begin{aligned} a - b &= -3 - 7 \\ &= -3 + (-7) \\ &= -10 \end{aligned}$$

Replace a with -3 and b with 7.
To subtract 7, add -7 .
Simplify.

EXERCISES**Subtract.**

1. $7 - 9$

2. $20 - (-6)$

3. $-10 - 4$

4. $0 - 12$

5. $-7 - 8$

6. $13 - 18$

7. $-20 - (-5)$

8. $-8 - (-6)$

9. $25 - (-14)$

10. $-75 - 50$

11. $15 - 65$

12. $19 - (-10)$

Evaluate each expression if $m = -2$, $n = 10$, and $p = 5$.

13. $m - 6$

14. $9 - n$

15. $p - (-8)$

16. $p - m$

17. $m - n$

18. $-25 - p$

3-6**Study Guide and Intervention*****Multiplying Integers***

The product of two integers with **different** signs is **negative**.

The product of two integers with the **same** sign is **positive**.

EXAMPLE 1 Multiply $5(-2)$.

$$5(-2) = -10 \quad \text{The integers have different signs. The product is negative.}$$

EXAMPLE 2 Multiply $-3(7)$.

$$-3(7) = -21 \quad \text{The integers have different signs. The product is negative.}$$

EXAMPLE 3 Multiply $-6(-9)$.

$$-6(-9) = 54 \quad \text{The integers have the same sign. The product is positive.}$$

EXAMPLE 4 Multiply $(-7)^2$.

$$\begin{aligned} (-7)^2 &= (-7)(-7) && \text{There are 2 factors of } -7. \\ &= 49 && \text{The product is positive.} \end{aligned}$$

EXAMPLE 5 Simplify $-2(6c)$.

$$\begin{aligned} -2(6c) &= (-2 \cdot 6)c && \text{Associative Property of Multiplication.} \\ &= -12c && \text{Simplify.} \end{aligned}$$

EXAMPLE 6 Simplify $2(5x)$.

$$\begin{aligned} 2(5x) &= (2 \cdot 5)x && \text{Associative Property of Multiplication.} \\ &= 10x && \text{Simplify.} \end{aligned}$$

EXERCISES**Multiply.**

- | | | |
|------------|---------------|-------------|
| 1. $-5(8)$ | 2. $-3(-7)$ | 3. $10(-8)$ |
| 4. $-8(3)$ | 5. $-12(-12)$ | 6. $(-8)^2$ |

ALGEBRA Simplify each expression.

- | | | |
|-------------|---------------|--------------|
| 7. $-5(7a)$ | 8. $3(-2x)$ | 9. $4(6f)$ |
| 10. $7(6b)$ | 11. $-6(-3y)$ | 12. $7(-8g)$ |

ALGEBRA Evaluate each expression if $a = -3$, $b = -4$, and $c = 5$.

- | | | |
|------------|-------------|-----------|
| 13. $-2a$ | 14. $9b$ | 15. ab |
| 16. $-3ac$ | 17. $-2c^2$ | 18. abc |

Study Guide and Intervention***Dividing Integers***

The quotient of two integers with different signs is negative.

The quotient of two integers with the same sign is positive.

EXAMPLE 1 Divide $30 \div (-5)$.

$30 \div (-5)$ The integers have different signs.

$30 \div (-5) = -6$ The quotient is negative.

EXAMPLE 2 Divide $-100 \div (-5)$.

$-100 \div (-5)$ The integers have the same sign.

$-100 \div (-5) = 20$ The quotient is positive.

EXERCISES**Divide.**

1. $-12 \div 4$

2. $-14 \div (-7)$

3. $\frac{18}{-2}$

4. $-6 \div (-3)$

5. $-10 \div 10$

6. $\frac{-80}{-20}$

7. $350 \div (-25)$

8. $-420 \div (-3)$

9. $\frac{540}{45}$

10. $\frac{-256}{16}$

ALGEBRA Evaluate each expression if $d = -24$, $e = -4$, and $f = 8$.

11. $12 \div e$

12. $40 \div f$

13. $d \div 6$

14. $d \div e$

15. $f \div e$

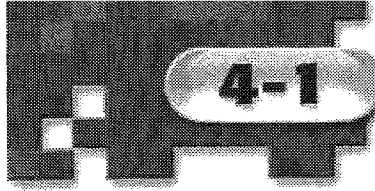
16. $e^2 \div f$

17. $\frac{-d}{e}$

18. $ef \div 2$

19. $\frac{f^2}{e^2}$

20. $\frac{de}{f}$

**4-1****Study Guide and Intervention****Writing Expressions and Equations**

The table below shows phrases written as mathematical expressions.

Phrases	Expression	Phrases	Expression
9 more than a number the sum of 9 and a number a number plus 9 a number increased by 9 the total of x and 9	$x + 9$	4 subtracted from a number a number minus 4 4 less than a number a number decreased by 4 the difference of h and 4	$h - 4$
Phrases	Expression	Phrases	Expression
6 multiplied by g 6 times a number the product of g and 6	$6g$	a number divided by 5 the quotient of t and 5 divide a number by 5	$\frac{t}{5}$

The table below shows sentences written as an equation.

Sentences	Equation
Sixty less than three times the amount is \$59. Three times the amount less 60 is equal to 59. 59 is equal to 60 subtracted from three times a number. A number times three minus 60 equals 59.	$3n - 60 = 59$

EXERCISES

Write each phrase as an algebraic expression.

- 7 less than m
- the quotient of 3 and y
- the total of 5 and c
- the difference of 6 and r
- n divided by 2
- the product of k and 9

Write each sentence as an algebraic equation.

- A number increased by 7 is 11.
- The price decreased by \$4 is \$29.
- Twice as many points as Bob would be 18 points.
- After dividing the money 5 ways, each person got \$67.
- Three more than 8 times as many trees is 75 trees.
- Seven less than a number is 15.

4-2**Study Guide and Intervention*****Solving Addition and Subtraction Equations***

Remember, equations must always remain balanced. If you subtract the same number from each side of an equation, the two sides remain equal. Also, if you add the same number to each side of an equation, the two sides remain equal.

EXAMPLE 1 Solve $x + 5 = 11$. Check your solution.

$$\begin{array}{rcl} x + 5 & = & 11 \\ - 5 & = & -5 \\ \hline x & = & 6 \end{array}$$

Write the equation.
Subtract 5 from each side.
Simplify.

Check $x + 5 = 11$ Write the equation.
 $6 + 5 \stackrel{?}{=} 11$ Replace x with 6.
 $11 = 11$ ✓ This sentence is true.

The solution is 6.

EXAMPLE 2 Solve $15 = t - 12$. Check your solution.

$$\begin{array}{rcl} 15 & = & t - 12 \\ + 12 & = & + 12 \\ \hline 27 & = & t \end{array}$$

Write the equation.
Add 12 to each side.
Simplify.

Check $15 = t - 12$ Write the equation.
 $15 \stackrel{?}{=} 27 - 12$ Replace t with 27.
 $15 = 15$ ✓ This sentence is true.

The solution is 27.

EXERCISES

Solve each equation. Check your solution.

1. $h + 3 = 14$

2. $m + 8 = 22$

3. $p + 5 = 15$

4. $17 = y + 8$

5. $w + 4 = -1$

6. $k + 5 = -3$

7. $25 = 14 + r$

8. $57 + z = 97$

9. $b - 3 = 6$

10. $7 = c - 5$

11. $j - 12 = 18$

12. $v - 4 = 18$

13. $-9 = w - 12$

14. $y - 8 = -12$

15. $14 = f - 2$

16. $23 = n - 12$

Study Guide and Intervention**Solving Multiplication Equations**

If each side of an equation is divided by the same non-zero number, the resulting equation is equivalent to the given one. You can use this property to solve equations involving multiplication and division.

EXAMPLE 1 Solve $45 = 5x$. Check your solution.

$$45 = 5x$$

Write the equation.

$$\frac{45}{5} = \frac{5x}{5}$$

Divide each side of the equation by 5.

$$9 = x$$

$$45 \div 5 = 9$$

Check $45 = 5x$

Write the original equation.

$$45 \stackrel{?}{=} 5(9)$$

Replace x with 9. Is this sentence true?

$$45 = 45 \checkmark$$

The solution is 9.

EXAMPLE 2 Solve $-21 = -3y$. Check your solution.

$$-21 = -3y$$

Write the equation.

$$\frac{-21}{-3} = \frac{-3y}{-3}$$

Divide each side by -3 .

$$7 = y$$

$$-21 \div (-3) = 7$$

Check $-21 = -3y$

Write the original equation.

$$-21 \stackrel{?}{=} -3(7)$$

Replace y with 7. Is this sentence true?

$$-21 = -21 \checkmark$$

The solution is 7.

EXERCISES

Solve each equation. Then check your solution.

1. $8q = 56$

2. $4p = 32$

3. $42 = 6m$

4. $104 = 13h$

5. $-6n = 30$

6. $-18x = 36$

7. $48 = -8y$

8. $72 = -3b$

9. $-9a = -45$

10. $-12m = -120$

11. $-66 = -11t$

12. $-144 = -9r$

13. $3a = 4.5$

14. $2h = 3.8$

15. $4.9 = 0.7k$

16. $9.75 = 2.5z$

4-4**Study Guide and Intervention****Solving Two-Step Equations**

To solve two-step equations, you need to add or subtract first. Then divide to solve the equation.

EXAMPLE 1 Solve $7v - 3 = 25$. Check your solution.

$$\begin{array}{rcl}
 7v - 3 & = & 25 \quad \text{Write the equation.} \\
 +3 & = & +3 \quad \text{Add 3 to each side.} \\
 \hline
 7v & = & 28 \quad \text{Simplify.} \\
 \frac{7v}{7} & = & \frac{28}{7} \quad \text{Divide each side by 7.} \\
 v & = & 4 \quad \text{Simplify.}
 \end{array}$$

Check

$7v - 3 = 25$	Write the original equation.
$7(4) - 3 \stackrel{?}{=} 25$	Replace v with 4.
$28 - 3 \stackrel{?}{=} 25$	Multiply.
$25 = 25 \checkmark$	The solution checks.

The solution is 4.

EXAMPLE 2 Solve $-10 = 8 + 3x$. Check your solution.

$$\begin{array}{rcl}
 -10 & = & 8 + 3x \quad \text{Write the equation.} \\
 -8 & = & -8 \quad \text{Subtract 8 from each side.} \\
 \hline
 -18 & = & 3x \quad \text{Simplify.} \\
 \frac{-18}{3} & = & \frac{3x}{3} \quad \text{Divide each side by 3.} \\
 -6 & = & x \quad \text{Simplify.}
 \end{array}$$

Check

$-10 = 8 + 3x$	Write the original equation.
$-10 \stackrel{?}{=} 8 + 3(-6)$	Replace x with -6 .
$-10 \stackrel{?}{=} 8 + (-18)$	Multiply.
$-10 = -10 \checkmark$	The solution checks.

The solution is -6 .

EXERCISES

Solve each equation. Check your solution.

- | | | | |
|--------------------|---------------------|----------------------|-----------------------|
| 1. $4y + 1 = 13$ | 2. $6x + 2 = 26$ | 3. $-3 = 5k + 7$ | 4. $6n + 4 = -26$ |
| 5. $7 = -3c - 2$ | 6. $-8p + 3 = -29$ | 7. $-5 = -5t - 5$ | 8. $-9r + 12 = -24$ |
| 9. $11 + 7n = 4$ | 10. $35 = 7 + 4b$ | 11. $15 + 2p = 9$ | 12. $49 = 16 + 3y$ |
| 13. $2 = 4t - 14$ | 14. $-9x - 10 = 62$ | 15. $30 = 12z - 18$ | 16. $7 + 4g = 7$ |
| 17. $24 + 9x = -3$ | 18. $50 = 16q + 2$ | 19. $3c - 2.5 = 4.1$ | 20. $9y + 4.8 = 17.4$ |