

Lesson 1.1 ~ Order of Operations

Name _____ Period _____ Date _____

Evaluate each expression. Show your work.

1. $4 + 3 \cdot 6 + 1$

2. $3(-2 + 5) - 4$

3. $(4 + 3)(8 - 1)$

4. $\frac{(-3 + 9)^2}{4}$

5. $2 \cdot 3 - 2 \cdot 6 + 14 \div 7$

6. $12 \div 3 \cdot 2 - 2^3$

7. $5|-6 + 2| - 8$

8. $(4 + 1)^2 + 3(2 + 7)$

9. $\frac{18 + 6(-2)}{3} + 10$

10. $\frac{|6 + (-15)|}{9}$

11. Sunset Middle School is putting on a Spring Musical. Tickets are \$6 for adults and \$2 for students. On opening night, they sold 90 tickets to adults and 50 tickets to students.
- Write an expression to represent the total amount of money collected in ticket sales on opening night.
 - How much money was collected in ticket sales on opening night?
12. Create an expression with at least four numbers and two different operations that has a value of 12.

Lesson 1.1C ~ Order of Operations

Name _____ Period _____ Date _____

Fill in the box with a number from 1 to 10 that makes the equation true. If there are two boxes in a problem, both boxes must contain the same number

1. $-5 + \square^2 \times 3 = 142$

2. $\frac{\square - 4^2 - (-1)}{4} = -4$

3. $\frac{40 - 13}{\square^2} \cdot 2 + 4 - \square = 7$

4. $6(7 - \square)^3 + 4 = -2$

5. $\frac{5|3 - \square|}{2} - 4 \cdot 2^3 + \square^2 = 27$

6. $\square(2^2 + 2^3) + 2^4 - 2^{\square} = 44$

Use the numbers 1, 2, 3, 4 and 5 once in each expression to create an answer that meets each criteria. Each expression must use at least one exponent and at least two different types of operations. You can make any of the values negative (e.g. -1, -2, etc).

Example: Has an answer that is even.

$$2^3 + 1 - 5 + 4$$

Uses each number once and equals 8, which is even.

7. Has an answer that is odd.
8. Has an answer that is divisible by 3.
9. Has an answer less than 0.
10. Has an answer that is a prime number.
11. Has an answer that is between -10 and -20.
12. Has an answer equal to 24.

Lesson 1.2 ~ Evaluating Expressions

Name _____ Period _____ Date _____

Evaluate each expression when $x = 6$.

1. $4x$

2. $x - 8$

3. $6x + 7$

4. $3(x - 5)$

5. $-5(x - 10)$

6. $2(x - 1)^2 + 1$

Evaluate each expression for the given values of the variables.

7. $2x + 3$ when $x = 4$

8. $12 - 3d$ when $d = 2$

9. $10(y + 5)$ when $y = -7$

10. $\frac{5p - 1}{2}$ when $p = 3$

11. $6a^2 - 14$ when $a = 3$

12. $7m + 1$ when $m = \frac{1}{2}$

13. $4(2x + 1) - 5$ when $x = -2$

14. $-2y + 3(y - 1)$ when $y = -1$

State whether each equation is true or false for the values of the variables given.

15. $2x - 4y = 8$ when $x = 4$ and $y = 0$

16. $3y + 5 = x$ when $x = 14$ and $y = 3$

17. $y = 7 + \frac{1}{4}x$ when $x = 4$ and $y = 8$

18. $3(x + 1) = 6y$ when $x = -5$ and $y = -3$

19. $\frac{1}{2}x + \frac{1}{4}y = 8$ when $x = 2$ and $y = 12$

Lesson 1.2C ~ Evaluating Expressions

Name _____ Period _____ Date _____

Functions are used in most high school and college math courses. Function notation is a different way to show what value you are substituted into an expression.

For example: $f(x) = 3x + 1$ is read “ f of x equals $3x + 1$ ”

When a number is in the parentheses, this number is substituted for the variable it replaced.

For example: $f(9) = ??$

Substitute 9 in for x in the equation above. $f(9) = 3(9) + 1 = 28$

$$f(9) = 28$$

Use the function $f(x) = 2x - 9$. Find each of the following.

1. $f(2)$

2. $f(7)$

3. $f(-3)$

4. $f\left(\frac{1}{2}\right)$

5. $f(-8)$

6. $f(0)$

Use the function $f(x) = x^2 - 4x + 3$. Find each of the following.

7. $f(2)$

8. $f(-5)$

9. $f(7)$

Sometimes, you may put a value through multiple functions. Always start with the function inside the parentheses and then use the new value in the second (outside) function.

For example: Find $g(f(2))$ when $f(x) = 3x$ and $g(x) = x + 7$.

First find $f(2)$.

$$f(2) = 3(2) = 6$$

Then plug 6 into $g(x)$.

$$g(6) = 6 + 7 = 13$$

Answer: $g(f(2)) = 13$

Use the function $f(x) = x^2 + 1$ and $g(x) = 10 - 3x$. Find each of the following.

10. $g(f(-2))$

11. $f(g(5))$

12. $g(f(1))$

Lesson 1.3 ~ The Distributive Property

Name _____ Period _____ Date _____

Use the distributive property to simplify each expression.

1. $2(x+7)$

2. $8(x-3)$

3. $-4(y-6)$

4. $-5(2x+3)$

5. $\frac{2}{3}(3x-6)$

6. $1.2(x+4)$

Find the product by using the distributive property. Show your work.

7. $3(97)$

8. $2(3.5)$

9. $8 \cdot 104$

10. $4(312)$

11. $998 \cdot 5$

12. $1006 \cdot 4$

Simplify each expression.

13. $3x+7+4x-2$

14. $-2(x-7)+3$

15. $5(x-1)-5$

16. $5(2x+3)+10$

17. $4x+3x-5x+2-x$

18. $10x-4-7x-2$

19. $3(x-4)+2(x+1)$

20. $5x+2(x+1)+3$

21. $3(x-4)+6$

22. $4(2x-1)+6-7x$

23. $6x+40+4x-15$

24. $5x-6+23-7x$

25. Each answer from #13 through #18 should match with one answer from #19 through #24.

Record which expression from #19 through #24 is equivalent to the simplified expressions for the exercises listed below.

#13 → _____

#14 → _____

#15 → _____

#16 → _____

#17 → _____

#18 → _____

Lesson 1.3C ~ The Distributive Property

Name _____ Period _____ Date _____

The Greatest Common Factor (GCF) is the largest number that divides a set of numbers. The GCF can be used when factoring. Factoring is a process in which an expression is broken into smaller parts. This is done by pulling out the GCF. Look at the example below.

Example: $4x + 6$
GCF between $4x$ and 6 is 2 .
Divide 2 from each term to get: $2(2x + 3)$
Check your work by distributing: $2(2x + 3) = 4x + 6$

Factor each expression using the GCF. Check your work using the Distributive Property.

1. $3x + 12$



2. $-6x + 10$



3. $20x - 16$



4. $-50x + 80$



5. $77 + 22x$



6. $21x - 14$



7. $9 + 36x$



8. $80x - 100$



Simplify each expression. Then factor the simplified expression using the GCF.

9. $4(h + 8) + 2h - 1 + 2h - 7$

10. $2(y + 5) + y - 4$

11. $3(2p + 1) + 9p + 2$

12. $10x + 4(x + 5) + 1$

Lesson 1.4 ~ Solving One-Step Equations

Name _____ Period _____ Date _____

Solve each equation. Show your work and check your solution.

1. $x + 13 = 47$

2. $4y = 28$

3. $p - 83 = 129$

4. $-8x = 72$

5. $\frac{w}{9} = 10$

6. $y + \frac{4}{5} = 1\frac{2}{5}$

7. $\frac{t}{-5} = -8$

8. $x - 13.6 = 22.8$

9. $-h = 14$

10. $p - 14 = -18$

11. $-3 + x = -16$

12. $\frac{1}{2}m = 10$

Write an equation for each statement. Solve each problem and check your solution.

13. The sum of a number and 12 is 31. Find the number.

14. The product of 5 and a number is -80 . Find the number.

15. A number decreased by 73 is 129. Find the number.

16. A number divided by -8 is 22. Find the number.

17. Eighteen and nine tenths is 2.6 less than a number. Find the number.

18. One-fourth of a number is 22. Find the number.

19. A number increased by 27 is 233. Find the number.

Lesson 1.4C ~ Solving One-Step Equations

Name _____ Period _____ Date _____

Solve each equation using inverse operations. Write a second equation using a different operation that has the same answer. The first one is done for you.

1. $x + 4 = 17$

Answer: $x = 13$

New Equation: $2x = 26$

2. $8 = \frac{y}{4}$

3. $m - 3.2 = -4.7$

4. $\frac{2}{3} + k = 1\frac{5}{6}$

5. $-7x = -84$

6. $\frac{p}{7} = 1.5$

7. $-12 = w - 34$

8. $\frac{3}{4}x = 2\frac{5}{8}$

9. $\frac{h}{3} = \frac{4}{12}$

Solve each equation using inverse operations. Write three more equations, each using a different operation, that has the same answer as the first. Each problem should have one equation for each operation (\times , \div , $+$, $-$).

10. $4 = \frac{m}{-5}$

11. $\frac{1}{2}h = 21$

12. $y - 41 = -52$

13. $x - \frac{1}{6} = \frac{1}{3}$

Write an algebraic equation for each problem. Solve each equation.

14. Kristina is four-fifths as old as her sister. Kristina is 12 years old. Write a multiplication equation and solve the equation to determine her sister's age.

15. Keaton sold three-fourths as much as Jimmy during a fundraiser. Keaton sold 60 products. How many products did Jimmy sell?

Lesson 1.5 ~ Solving Two-Step Equations

Name _____ Period _____ Date _____

Solve each equation. Show your work and check your solution.

1. $2x + 13 = 35$

2. $\frac{m}{7} - 4 = 3$

3. $5p - 8 = 42$

4. $-9x - 1 = 44$

5. $4 = \frac{v}{11} - 2$

6. $-x + 1.2 = 12.8$

7. $-2 + \frac{y}{10} = -6$

8. $60 = 12h - 24$

9. $\frac{1}{3}h + 2 = 3$

10. $-3d - 7 = -10$

11. $8 - 4x = 36$

12. $\frac{t}{3} + 16 = 34$

Write an equation for each statement. Solve each problem and check your solution.

13. Eight more than twice a number is eight. Find the number.

14. Seven decreased by three times a number is forty. Find the number.

16. Johanna starts the month with \$54 in her savings account. At the end of each week, Johanna adds \$8 to the account.

a. How much will Johanna have in her account after 5 weeks?

b. Write a formula that could be used to calculate Johanna's total savings (S) based on how many weeks (w) she has deposited money in the bank.

c. Use your formula to determine how many weeks have passed when Johanna reaches \$166 in her account.

Lesson 1.5C ~ Solving Two-Step Equations

Name _____ Period _____ Date _____

Write an equation for each situation. Solve the problem. Show your work and check your solution.

1. AJ started the day with \$90. He bought three used video games and had \$27 remaining. If each video game cost the same amount, what was the price of each game?
2. Sara took a large bag of flour and put the same amount into four different containers. She had 1.7 pounds of flour remaining. If she started with 16.1 pounds of flour, how much flour is in each container?
3. Maria is thinking of a number. If she divides her number by six and then subtracts 11, she gets 1. What is Maria's number?
4. Ivan bought a new television. He was able to pay \$120 at the time he received the television. He will pay \$44 each month on the balance. The original cost of the television was \$736. How many months will it take Ivan to pay off the television?
5. The zoo fed the large animals 1,023 pounds of food last week. Nine large animals each received the same amount while the elephant ate 195 pounds of the food. How much did each of the nine large animals receive?
6. Rick is 3 years older than half his brother's age. Rick is 13 years old. How old is his brother?
7. Lucy ate eight more than three times as many pretzels as Matt. Lucy ate 56 pretzels. How many pretzels did Matt eat?

Lesson 1.6 ~ Solving Multi-Step Equations

Name _____ Period _____ Date _____

Solve each equation and check your solution.

1. $3(2x + 4) = 60$

2. $5x + 1 = 8x - 23$

3. $45 = 5(3x - 6)$

4. $3(x + 2) = 4(x + 1)$

5. $6 - 3x = 2x - 24$

6. $7(2x - 3) = 7$

7. $3x + 5 = 5(x - 3)$

8. $4x + 17 = -2x + 23$

9. $10x - 9 = -2x - 69$

10. $15x = 12(x - 3)$

11. $6x + 3 = 2x + 3$

12. $5(x - 1) = 20(x - 10)$

13. Xavier spent \$84 on art supplies. The canvas for each of his paintings is an additional \$1. He plans to sell his paintings for \$8.

a. Write an equation that could be used to find the number of paintings (p) he will need to sell to break even.

b. Solve the equation from **part a**. Check the solution.

Lesson 1.6C ~ Solving Multi-Step Equations

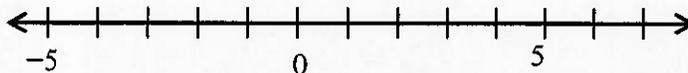
Name _____ Period _____ Date _____

Solve each inequality. Graph the solution on a number line. See Core Focus on Linear Equations Lesson 1.8 for tips on solving and graphing linear inequalities.

$$\begin{array}{r}
 1. \quad x + 3 \leq 12 \\
 \quad \underline{-3 \quad -3} \\
 \quad \quad x \leq 9
 \end{array}$$



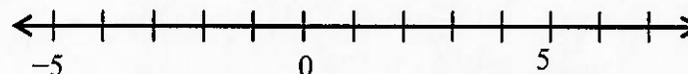
$$2. \quad 2f + 4 < 5f - 11$$



$$3. \quad 5(p + 3) > 3p + 13$$



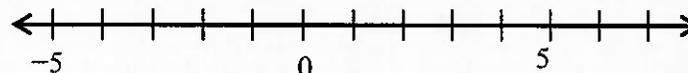
$$4. \quad 3y + 5 \geq 7y - 19$$



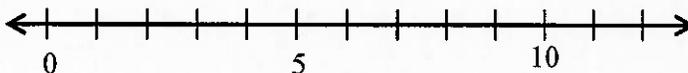
$$5. \quad 3m > 2(m + 1) + 7$$



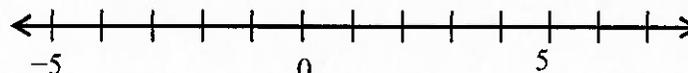
$$6. \quad 4w - 7 \leq 9w + 13$$



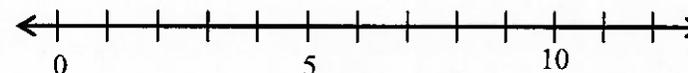
$$7. \quad 2x + 19 < 10x - 45$$



$$8. \quad 3(h - 1) \geq 4(h + 3) - 14$$



$$9. \quad 7y + 13 > 4y + 13$$



Lesson 1.7 ~ Solutions to Linear Equations

Name _____ Period _____ Date _____

Solve each equation. Describe the number of solutions (one, none or infinitely many).

1. $2(x - 6) = 4x - 24$

2. $3x - 1 = 3x + 7$

3. $2x = 11x - 36$

4. $6x - 3 + 2x = 8x + 7 - 10$

5. $7(x - 2) + 1 = -34$

6. $\frac{1}{2}(x + 4) = \frac{1}{2}x + 1$

7. $\frac{x}{8} - 5 = 7$

8. $5(x - 3) + 1 = 5x - 14$

9. $10x + 4 - 8x = 2(x - 1)$

10. Matt and Kara solved the equation $8(x - 5) = 8x + 40$. Kara said the answer was $x = 0$ and Matt said there are no solutions. Who is correct? Support your answer with work.

11. Isaac wrote two simplified expressions that were not equal to each other. Each equation also had a different coefficient on the variable. If he sets the expressions equal to each other, will the equation have one solution, no solution or infinitely many solutions? Use an example to support your answer.

Lesson 1.7C ~ Solutions to Linear Equations

Name _____ Period _____ Date _____

Set each expression on the left side equal to each expression on the right side of the line. Solve each equation you write. Describe the number of solutions (one, none or infinitely many). If there is one solution, give the answer as an integer or a simplified fraction.

Organize your work below by listing the number of one expression with the letter of the other.

1. $3x + 6$

2. $2(x + 1) - 4$

3. $5x - 1$

A. $5x - 6$

B. $5(x - 1) + 4$

C. $6x + 3 - 3x$

D. $x - 1 + x - 1$

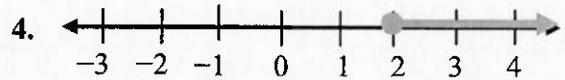
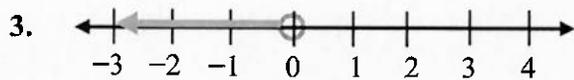
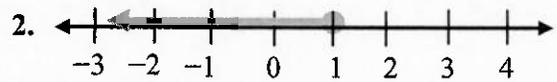
E. $3(x - 4) + 18$

F. $2x - 4$

Lesson 1.8 ~ Linear Inequalities in One Variable

Name _____ Period _____ Date _____

Write the inequality for each graph shown. Use x as the variable.



Solve each inequality below. Graph the solution on a number line.

5. $3x + 1 > 7$

6. $\frac{x}{2} - 1 \leq -3$

7. $-5x + 4 < 9$

8. $14 \leq 2(x + 3)$

9. $-4 \leq \frac{x}{-3} - 2$

10. $3x + 4 < x + 4$

11. A forklift has a maximum carrying capacity of 1,400 pounds.

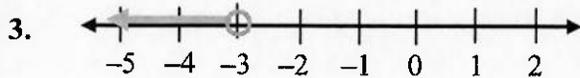
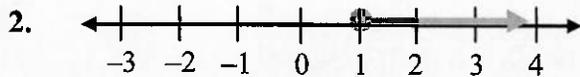
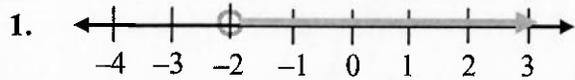
a. Each box at the warehouse weighs 50 pounds. Write an inequality to show the number of boxes that the forklift can hold.

b. A 150-pound crate is used to hold the boxes on the forklift. What is the maximum number of boxes that the forklift can carry in the crate?

Lesson 1.8C ~ Linear Inequalities in One Variable

Name _____ Period _____ Date _____

Write a two-step equation that has the solution shown in each graph. Use x as the variable.



Solve each inequality below. Graph the solution on a number line.

5. $4(x+8) > 5x+30$

6. $\frac{1}{3}x - 7 \leq -5$

7. $-3x - 4 < 6x + 32$

8. $4(x+3) \leq 2(x-1) + 4$

9. Jacqui is three more than five times as old as Sam. Jacqui is at least 43 years old. What simplified inequality shows Sam's possible age range?

10. Maria's cat eats less than 1 cups of food each day. Her cat eats one-third of what Maria's dog Eats plus half of a cup. What simplified inequality shows the possible amounts that Maria's dog eats in cups?

7th Grade Advanced Math

Book 1: Linear Equations

Block 1: Expressions & Equations

Independent Practice

Worksheet Packet

Name: _____

Period: _____