Table of Contents

Chapter 3 Expressions and Equations

Page	Title	Grade
1	3.1 Algebraic Expressions Notes	
2	3.1 Practice A Homework *See video at msabadie.weebly.com*	
3	3.1 Mini Quiz	
4-5	3.2 Adding and Subtracting Linear Expressions Notes	
6-7	3.2 Practice A Homework *See video at msabadie.weebly.com*	
8	3.2 Mini Quiz	
9	3.3 Solving Equations using Addition or Subtraction Notes	
10	3.3 Practice A Homework *See video at msabadie.weebly.com*	
11	3.3 Mini Quiz	
12	3.4 Solving Equations using Multiplying and Dividing Notes	
13	3.4 Practice A Homework *See video at msabadie.weebly.com*	
14	3.4 Mini Quiz	
15	3.5 Solving Two-Step Equations Notes	
16	3.5 Practice A Homework *See video at msabadie.weebly.com*	
17	3.5 Mini Quiz	
18	Take Home Quiz #1 *See video at msabadie.weebly.com*	
19	Take Home Quiz #2 *See video at msabadie.weebly.com*	
20-21	Test Review	
	Chapter 3 Test	
	My Current Class Average	

Parent Signature _____ **Date** _____

Student Signature _____ **Date** _____

Teacher Signature _____ **Date** _____

Name _____ Class Period _____

Evaluation of Notes

Criteria	10 – Unsatisfactory	20 – Satisfactory	25 – Good	30 – Excellent	Score
Set-up and Neatness	• No name • Paper appears to have been scrunched, put through a blender, or used as a napkin	• Name • Handwriting is hard to read.	• Name and class period • Some extra notes added	• Name and class period • Many extra notes added	____
Completion of practice	• One or more sections are blank	• Some practice is not complete • Not all work is shown	• All practice is complete • Some work not shown	• All practice complete • All work shown	____
Text marking	• None of the notes are highlighted or underlined	• One or more sections are missing highlighting or underlining	• Each section contains highlighting or underlining.	• Every key point is highlighted or underlined and it is done so neatly.	____
Completed on time or within one day of being absent? +10 points!					____
				Total Score	

Evaluation of Homework

Criteria	0 – Unsatisfactory	30 – Satisfactory	40 – Good	50 – Excellent	Score
Set-up and Neatness	• No name • Paper appears to have been scrunched, put through a blender, or used as a napkin	• Name • Handwriting is hard to read.	• Name and class period • Some answers are boxed	• Name and class period • All answers are boxed	____
Completion of practice	• The homework is not done or attempted.	• Some problems are not done. • Not all work is shown	• All practice is complete • Some work not shown	• All practice complete • All work shown	____
				Total Score	

Name _____ Ms. Abadie's _____ Period

Chapter 3	Expressions (no equal sign) and Equations (equal sign)
MAFS.7.EE.1.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."
Essential Question	What are terms and like terms and how do you identify them? In this lesson, I am *identifying terms and like terms in an expression by first writing the expression as a sum of its terms* so I can *later apply this to adding/subtracting expressions and solving equations.*
3.1 Algebraic Expressions	Terms: parts of an algebraic expression separated by a plus or minus Like Terms: terms that have the same variable raised to the same exponent Constant Terms: like terms without variables Simplest Form: an expression with no like terms and no parenthesis
Homework **3.1 Practice A** **#1-3**	**Identify the terms and like terms in the expression.** **1.** $y + 10 - \frac{3}{2}y$ **2.** $2r^2 + 7r - r^2 - 9$ **3.** $7 + 4p - 5 + p + 2q$
Homework **3.1 Practice A** **#4-11**	**Simplify the expression.** **4.** $14 - 3z + 8 + z$ **5.** $2.5x + 4.3x - 5$ **6.** $\frac{3}{8}b - \frac{3}{4}b$
Homework **3.1 Practice A** **#4-11**	**Simplify the expression.** **7.** $3(q + 1) - 4$ **8.** $-2(g + 4) + 7g$ **9.** $7 - 4\left(\frac{3}{4}x - \frac{1}{4}\right)$

Name_____ Date_____

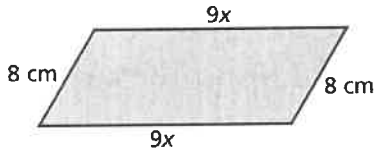
3.1 Practice A

Identify the terms and like terms in the expression.

1. $-4y + 7 + 9y - 3$
2. $3n^2 - 1.4n + 5n^2 - 6.4$
3. $\frac{1}{2}b^3 - b^3 + 2b$

Simplify the expression.

4. $-15m + 9m$
5. $8k - 2(4 - 3k)$
6. $3.2 - 9x + 7.1 - 3x$
7. $25 - 6x - 12 - 2x$
8. $19a - 7 - 3a + 12a$
9. $\frac{5}{2}(6x - 7) + \frac{4}{3}(2 + 9x)$
10. $\frac{1}{8}h + 7 - \frac{3}{4}h$
11. $\frac{2}{3}y + 5 - 3 - \frac{11}{12}y$
12. Write an expression in simplest form that represents the perimeter of the polygon.



13. Each runner is carrying an 8 ounce bottle of water, a 2.1 ounce energy bar, and a 3 ounce energy drink. Write an expression in simplest form that represents the weight carried by y runners. Interpret the expression.
14. John weighs 65 kilograms, Sam weighs $22x$ kilograms, and Mark weighs $13x$ kilograms. Write an expression in simplest form for their combined weight.
15. Are the expressions $8a^2 - 4b + 7a^2$ and $5(3a^2 - 2b) + 6b$ equivalent? Explain your reasoning.

MAFS.7.EE.1.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
Essential Question	How can you simplify linear expressions? In this lesson, *I will add or subtract linear expressions using a vertical or horizontal method of combining like terms* so I can *simplify the expression down to a variable term and constant term.*
3.2 Adding and Subtracting Linear Expressions	Linear expression: is an algebraic expression in which the exponent of the variable is 1.
Homework **3.2 Practice A** **#1-8**	**Find the sum.** **1.** $(x + 3) + (2x - 1)$ **2.** $(-8z + 4) + (8z - 7)$ **3.** $(4 - n) + 2(-5n + 3)$ **4.** $\frac{1}{2}(w - 6) + \frac{1}{4}(w + 12)$
Homework **3.2 Practice A** **#10-15**	**Find the difference.** **5.** $(m - 3) - (-m + 12)$ **6.** $-2(c + 2.5) - 5(1.2c + 4)$
	What is the sum of the two expressions? $\left(\frac{2}{5}x + 3\right) + \left(\frac{1}{5}x - 1\right)$

	Find the difference of the two expressions. $\left(\frac{2}{5}x+5\right)-\left(\frac{1}{5}x-3\right)$
	An expression is shown. $2\left(\frac{3}{5}x+3\right)-\left(\frac{2}{3}x-1\right)$ Create an equivalent expression without parentheses.
Factoring Expressions	Factoring means writing the expression as a product of its factors by dividing each term by the greatest common factor.
Homework **3.2 extension** **#1-9**	**Factor the expression using the GCF.** **1.** $9+21$ **2.** $32-48$ **3.** $8x+2$ **4.** $3y-24$ **5.** $20z-8$ **6.** $15w+65$ **7.** $36a+16b$ **8.** $21m-49n$
Homework **3.2 extension** **#10-17**	**Factor out the coefficient of the variable.** **9.** $\frac{1}{3}b-\frac{1}{3}$ **10.** $\frac{3}{8}d+\frac{3}{4}$ **11.** $2.2x+4.4$ **12.** $4h-3$

Name_____ Date_____

3.2 Practice A

Find the sum.

1. $(p - 3) + (p - 7)$
2. $(3n - 1) + (4 - n)$
3. $(-3r + 8) + (5r - 1)$
4. $6(x - 3) + (2x - 9)$
5. $(3c + 2) + 4(1.3c - 5)$
6. $10(2.1q - 2) + (7.5q + 18)$
7. $(-6y - 2) + 5(3 + 2.5y)$
8. $\frac{1}{2}(6x - 10) + \frac{1}{3}(6 + 9x)$

9. After a week of rain, tadpoles appeared in your pond. After t minutes, you have $(7t + 5)$ tadpoles and your friend has $(8t - 3)$ tadpoles.

   a. Write an expression that represents the number of tadpoles you and your friend caught together.

   b. Who has more tadpoles after 9 minutes?

Find the difference.

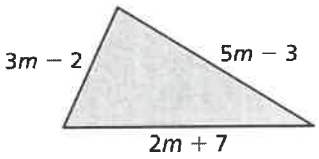
10. $(k + 3) - (3k - 5)$
11. $(-6d + 2) - (7 + 2d)$
12. $(10j - 7) - (-9j + 2)$
13. $(3x + 8) - 6(2.5x - 3)$
14. $(7 - 3t) - 5(-1.6t + 5)$
15. $\frac{1}{2}(12w + 8) - \frac{1}{5}(10w - 5)$

16. The admission to a local fair is \$10 for each adult and \$6 for each child. Each rides costs \$1.50 for an adult and \$1 for a child.

   a. Write an expression that represents how much more an adult will spend at the fair.

   b. An adult and a child each go on 7 rides. How much more did the adult spend?

17. Write an expression that represents the perimeter of the triangle.



Name _____ Date _____

Extension 3.2 Practice

Factor the expression using the GCF.

1. $8 - 22$
2. $25 + 30$
3. $6y + 3$
4. $2t - 10$
5. $16p - 8$
6. $21s + 15$
7. $32v + 24w$
8. $9b + 24c$
9. $12y - 42z$

Factor out the coefficient of the variable.

10. $\frac{1}{2}m + \frac{1}{2}$
11. $\frac{2}{3}j - \frac{2}{9}$
12. $1.2k + 2.4$
13. $1.5a - 4.5$
14. $3f + 5$
15. $\frac{3}{10}x - \frac{3}{5}$

16. Factor $-\frac{1}{3}$ out of $-\frac{1}{3}x - 12$.

17. Factor $-\frac{1}{6}$ out of $-\frac{1}{3}x + \frac{5}{6}y$.

18. The area of the rectangle is $(18x - 12)$ square inches. Write an expression that represents the length of the rectangle (in inches).

19. A concession stand sells hamburgers. The revenue from the hamburgers is $(30x + 45)$ dollars.

    a. The price of a hamburger is \$5. Write an expression that represents the number of hamburgers sold.

    b. The revenue from drinks is $(63x + 84)$ dollars. The price of a drink is \$3. Write an expression that represents the number of drinks sold.

    c. Write and simplify an expression that represents how many more drinks were sold.

7

MAFS.7.EE.2.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations to solve problems by reasoning about the quantities.
Essential Question	How can you solve a one-step equation using addition/subtraction? In this lesson, *I will use addition/subtraction properties of equality* so I can solve *one-step equations.*
3.3 Solving Equations using Addition or Subtraction	Two equations are equivalent (equal) equations if they have the same solutions. The Addition Property of Equality: adding the same number to both sides of an equation produces an equivalent equation. The Subtraction Property of Equality: subtracting the same number to both sides of an equation produces an equivalent equation.
Homework 3.3 Practice A #1-12	**Solve the equation. Check your solution.** **1.** $p - 5 = -2$ **2.** $w + 13.2 = 10.4$ **3.** $x - \frac{5}{6} = -\frac{1}{6}$
	4. A company has a profit of \$120.50 today. This profit is \$145.25 less than the profit P yesterday. Write an equation that can be used to find P. **5.** **WHAT IF?** You have -12 points after Level 1. Your score is 27 points less than your friend's score. What is your friend's score?

Name_____ Date_____

3.3 Practice A

Solve the equation. Check your solution.

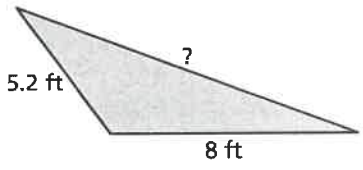
1. $x + 3 = 10$
2. $b - 6 = -14$
3. $5 = n + 9$
4. $y - 2.1 = 7.5$
5. $-6.4 = x + 4.3$
6. $k - \frac{1}{3} = \frac{5}{6}$
7. $10.5 + p = -8.32$
8. $3\frac{3}{4} = r + \frac{1}{8}$
9. $m + 1.06 = 5$
10. $-\frac{7}{12} = 1\frac{5}{6} + d$
11. $t - \frac{2}{7} = \frac{1}{2}$
12. $-10.2 + c = -8.14$

Write the word sentence as an equation. Then solve.

13. 5 more than a number y is -2.
14. The sum of 8 and a number h is 12.
15. -13 is 4 less than a number n.

In Exercises 16–20, write an equation. Then solve.

16. You earn \$9 per hour babysitting. This is \$2 more than what you earned per hour last year. What did you earn per hour last year?
17. Your mother asked you to turn the oven down to 325°F. This is 75°F less than it was. What was the original temperature?
18. The difference between the heights of your chair and your desk is $-10\frac{1}{4}$ inches. The height of your desk is $29\frac{3}{4}$ inches. What is the height of your chair?
19. Your Two-Day-Pass to a theme park is \$76.50. This is \$31.41 less than your uncle's Two-Day-Pass. What is the price of your uncle's pass?
20. The perimeter of a triangle is 25 feet. What is the length of the unknown side?



21. Find the value of $3x + 2$ when $7 + x = 5$.

MAFS.7.EE.2.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations to solve problems by reasoning about the quantities.
Essential Question	How can you solve a one-step equation using multiplication/division? In this lesson, *I will use multiplication/division properties of equality* so I can solve *one-step equations.*
3.4 Solving Equations using Multiplication or Division	The Multiplication Property of Equality: multiplying the same number to both sides of an equation produces an equivalent equation. The Division Property of Equality: dividing the same number to both sides of an equation produces an equivalent equation.
Homework **3.4 Practice A** **#1-6**	**Solve the equation. Check your solution.** **1.** $\frac{x}{5} = -2$ **2.** $-a = -24$ **3.** $3 = -1.5n$
Homework **3.4 Practice A** **#7-12**	**Solve the equation. Check your solution.** **4.** $-14 = \frac{2}{3}x$ **5.** $-\frac{8}{5}b = 5$ **6.** $\frac{3}{8}h = -9$
	7. The record low temperature in Hawaii is –0.15 times the record low temperature in Alaska. The record low temperature in Hawaii is 12°F. What is the record low temperature in Alaska?

Name_____ Date_____

3.4 Practice A

Solve the equation. Check your solution.

1. $4b = 24$
2. $-7n = 35$
3. $\frac{y}{-3} = 33$
4. $\frac{p}{5} = -32$
5. $-3t = -4.2$
6. $1.5q = -8.4$
7. $\frac{1}{5}d = -3$
8. $14 = 3y$
9. $\frac{g}{2.1} = -6.8$
10. $-\frac{3}{5}a = 2$
11. $\frac{k}{-9} = -\frac{1}{3}$
12. $\frac{5}{8}j = -10$

Write the word sentence as an equation. Then solve.

13. A number multiplied by $\frac{1}{2}$ is $-\frac{5}{12}$.
14. The quotient of a number and 0.2 is -2.6.

In Exercises 15–19, write an equation. Then solve.

15. You earn \$7.50 per hour at a fast food restaurant. You earned \$123.75 last week. How many hours did you work last week?
16. Your family took a road trip on Saturday. You were in the car for 4.5 hours and averaged 70 miles per hour. How many miles did you travel?
17. The area of a rectangle is $\frac{1}{2}$ square inch. The length of the rectangle is $\frac{3}{8}$ inch. What is the width of the rectangle?
18. You are in a room with other students and are asked to get in groups of 3. When finished, there are 21 groups of 3. How many students are in the room?
19. The perimeter of a square is 26.46 inches. What is the side length of the square?
20. Write a multiplication equation that has a solution of $\frac{2}{7}$.
21. Write a division equation that has a solution of -20.

MAFS.7.EE.2.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically.
Essential Question	How can you solve a two-step equation? In this lesson, *I will use properties of equality* so I can solve *two-step equations.*
3.5 Solving Two-Step Equations **Homework** **3.5 Practice A** **#1-9**	**Solve the equation. Check your solution.** **1.** $2x + 12 = 4$ **2.** $-5c + 9 = -16$ **3.** $3(x - 4) = 9$
Homework **3.5 Practice A** **#10-12**	**Solve the equation. Check your solution.** **4.** $\frac{m}{2} + 6 = 10$ **5.** $-\frac{z}{3} + 5 = 9$ **6.** $\frac{2}{5} + 4a = -\frac{6}{5}$
Homework **3.5 Practice A** **#16-18**	**Solve the equation. Check your solution.** **7.** $4 - 2y + 3 = -9$ **8.** $7x - 10x = 15$ **9.** $-8 = 1.3m - 2.1m$

15

Name_____ Date_____

3.5 Practice A

Solve the equation. Check your solution.

1. $3k - 2 = 10$

2. $5p + 2 = -10$

3. $-4x + 3 = -11$

4. $12 = 2d + 3.2$

5. $-1 - 5h = 14$

6. $1.25r - 7 = 2.5$

7. $-4k + 3.6 = 7.8$

8. $6 + 2n = 3$

9. $4y - 16.3 = 53.1$

10. $\frac{1}{2}b + \frac{9}{4} = \frac{7}{4}$

11. $\frac{5}{6} + 3j = -\frac{2}{3}$

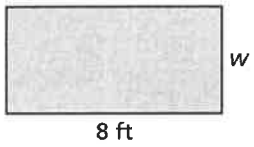
12. $-\frac{9}{10}p - 3 = \frac{3}{5}$

In Exercises 13–15, write an equation. Then solve.

13. It costs \$4 to enter the fair. Each ride costs \$2.50. You have \$21.50. How many rides can you go on?

14. The cable company charges a monthly fee of \$45. Each movie rental is \$1.99. You owe \$68.88. How many movies did you rent?

15. The perimeter of the rectangle is 24 feet. What is the width of the rectangle?



Solve the equation. Check your solution.

16. $7c - 2c = 45$

17. $3(k - 5) = -16$

18. $-2(m + 1) = 10$

19. The senior class has 412 students. They are assigned to different homerooms. There are 28 students in the smallest homeroom and the remaining 12 homerooms have the same number of students. How many students are in each of the remaining 12 homerooms?

20. You purchased paint for the rooms in your house. You have 1.5 cans of paint left. You painted 4 rooms and each room required 2 cans of paint. You spilled $\frac{1}{2}$ of a can of paint. How many cans of paint did you purchase?

a. Solve the problem by working backwards.

b. Solve the equation $\frac{x - 2}{4} = 2$. How does the answer compare to part (a)?

Name _____ Date _____

Chapter 3 Take Home Quiz #1

For use after Section 3.2

Identify the terms and like terms in the expression.

1. $10x + 5 + 3x + 1$
2. $-2n + 7n - r + 10r$
3. $-12h^2 - 4 + 9 - 3h^2$
4. $1.4c + 11.4 - 2c - 7.3c$

Simplify the expression.

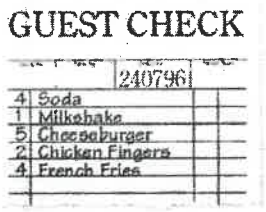
5. $8v - 15v$
6. $7d + 5 - 4d$
7. $12x + 9 - 3x - 4$
8. $3(x - 4) + 5x$

Find the sum or difference.

9. $(3x - 5) + (-4x + 1)$
10. $6(-2.1k - 2) + (7k + 5)$
11. $(2m + 7) - (3 - 4m)$
12. $\frac{2}{3}(6c + 4) - (8c - 5)$

Factor out the coefficient of the variable.

13. $\frac{1}{2}d + 6$
14. $-3.6z - 10.8$
15. You and your friends order food from a menu where each item costs the same amount. Write an expression in simplest form that represents the total amount of money the order will cost.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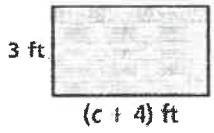
4	Soda
1	Milkshake
5	Cheeseburger
2	Chicken Fingers
4	French Fries

16. Write an expression in simplest form for the area of the rectangle.



17. Eastside Bowling charges $2.25 for shoes and $3.00 per game. Westside Bowling charges $1.75 for shoes and $2.50 per game. Write an expression in simplest form that represents how much more Eastside Bowling charges than Westside Bowling.

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____

Name _____ Date _____

Chapter 3

Take Home Quiz #2

For use after Section 3.5

Solve the equation. Check your solution.

1. $b - 6 = -11$

2. $8 = q + 15$

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

4. $-2.5 + w = 3.7$

5. $\frac{n}{-5} = 7$

6. $-2p = \frac{4}{11}$

7. $17 = -7z + 3$

8. $\frac{a}{6} - \frac{1}{2} = \frac{1}{3}$

Write the word sentence as an equation. Then solve.

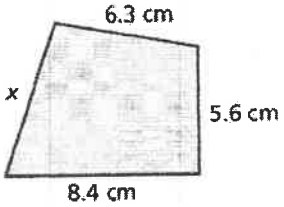
9. 3 less than a number h is -12.

10. The sum of a number b and 7.5 is 4.8.

11. The product of $-\frac{3}{4}$ and a number x is -27.

12. The quotient of a number m and -3.2 is 15.

13. The perimeter of the polygon is 27.4 centimeters. Write and solve an equation to find the unknown side length.



14. The bottom floor of a parking garage has an elevation of -36 feet. The top floor is 124 feet higher. What is the elevation of the top floor?

15. Store A sells jeans for $\frac{7}{8}$ of the price at Store B. Store A sells jeans for \$35. Write and solve an equation to find how much you save by buying jeans at Store A.

16. You are biking to your friend's house to do math homework. Halfway there, you realize you forgot your textbook, so you turn around. After biking 0.25 mile, you are one mile from your house. What is the distance between your house and your friend's house?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____

19

Name _____ Date _____

Chapter 3 Ms. Abadie's Test Review

Identify the terms and like terms in the expression.

1. $m + 3n + 6m$
2. $-2t + 3t^2 - 10 - 14t$
3. $5x^2 + 7x - 3 + 10x^2 - 5x - 20$

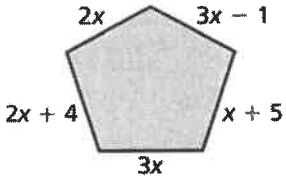
Find the sum or difference.

4. $(3 - 7m) + 2(3.5m + 1)$
5. $\frac{1}{2}(8 - 6y) + \frac{1}{5}(10y - 25)$
6. $(4a - 5) - 8(-2.5a + 3)$
7. $\frac{2}{3}(7w + 4) - \frac{1}{3}(2w - 1)$

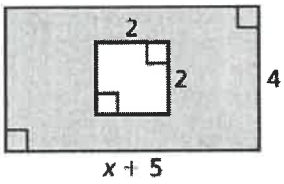
Factor out the coefficient of the variable.

8. $2.6x + 23.4$
9. $-\frac{3}{5}k - \frac{3}{10}$

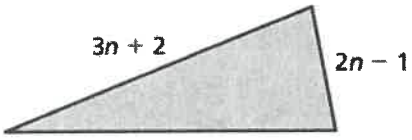
10. Write an expression that represents the perimeter of the polygon.



11. Write a formula for the area of the shaded region in terms of x.



12. The expression $9n + 1$ represents the perimeter (in meters) of the triangle. Write an expression in simplest form that represents the measure of the third side.



Solve the equation. Check your solution.

13. $y + 14.6 = -31.75$

14. $m - \frac{5}{8} = -\frac{1}{4}$

15. $\frac{x}{6.2} = -2.1$

16. $-18v = -414$

Find the value(s) of x.

17. $5x - 8x = 15$

18. $3(x + 1) = -24$

19. $|x| + 3 = 14$

20. $|x + 2| = 7$

Write the word sentence as an equation. Then solve.

21. The sum of a number a and negative 12 is 6.

22. 45 equals the quotient of a number n and 3.

23. The difference of 2.1 and twice a number p is negative 4.7.

24. One-half the sum of a number z and $3\frac{1}{2}$ is $4\frac{1}{2}$.

25. You drink g 8-ounce glasses of water plus a 20-ounce bottle of water. You drank 76 ounces of water today. Write and solve an equation to determine the number of glasses of water you drank.

26. Your friend has owned a dog for 9 years. This is one year less than twice as long as he has owned a cat. How long has your friend owned a cat?

27. Litter cleanup volunteers form 4 groups containing v volunteers each. Then 10 more volunteers show up. The volunteers regroup into 5 groups each containing 6 people. How many volunteers were in each original group?