

**EQUATIONS WITH ...**LIKE TERMS

- 1) Combine any like terms on each side of the equal sign.
- 2) Solve for the variable.

GROUPING SYMBOLS

- 1) Use the distributive property to undo ( ).
- 2) Combine any like terms on each side of the equal sign.

1)  $-6x + 8 + 4x = 14$

2)  $3(4 - 2x) = 24$

3)  $-4x + 5 - 5x = 14$

4)  $5x + 3x - 8 - 10x = -10$

5)  $-8(y - 6) = -16$

6)  $-3n + 8n - 11 + 4n = 7$

7)  $-31g - 20 + 3g + 2 = 38$

8)  $12 + 3(2x - 5) = 21$

9)  $-5(x + 8) + 10x = -55$

Name: \_\_\_\_\_

## Algebra Practice Problems

Date: \_\_\_\_\_

1.)  $5 + 5x - 4x = 11$

2.)  $3x - 6 + 6x = 30$

3.)  $30 = x + 7x + 6$

4.)  $-8 - 6x + 7x = 4$

5.)  $18 = -2x + 5x + 9$

6.)  $-4 = 2x + 3x + 1$

7.)  $-5 + 4x + 5x = 31$

8.)  $1 + 4x - 5x = -4$

9.)  $5 = 2x - 7x + 10$

10.)  $-3 + 3x + 6x = 105$

11.)  $5x + 5 - x = 13$

12.)  $-8 + 7x + 3x = 92$

## Algebra Practice Problems

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1.)  $-2(9 - 5x) = 42$

2.)  $-4(2 + 7x) = -288$

3.)  $-2(6 + 2x) = -12$

4.)  $3(6x + 9) = 27$

5.)  $5(-1 + 3x) = 85$

6.)  $-4(5 + 2x) = 60$

7.)  $2(-5 - 5x) = -90$

8.)  $5(-10 - 6x) = -20$

9.)  $-2(2x - 2) = 48$

10.)  $5(2 + 2x) = 110$

11.)  $6(-4x - 10) = -60$

12.)  $4(-4x + 10) = -72$

13.)  $5(3x + 7) = 95$

14.)  $5(-7 + 2x) = -105$

## Algebra Practice Problems

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1.)  $4x - 8 + 2x = 34$

2.)  $3 - 5x + 3x = -5$

3.)  $-18 = x - 4x + 3$

4.)  $3x + 9 - 5x = 9$

5.)  $-84 = x + 7x - 4$

6.)  $-4x + 2 + 2x = 14$

7.)  $26 = -7x + 3x + 6$

8.)  $-3 + x + 4x = -23$

9.)  $3x - 9 - 2x = -12$

10.)  $-12 = 2x + 3x + 8$

11.)  $6x + 9 + x = 37$

12.)  $x - 9 - 7x = -51$

## Two-Step Equation Word Problems

- 1) 331 students went on a field trip. Six buses were filled and 7 students traveled in cars. How many students were in each bus?
- 2) Aliyah had \$24 to spend on seven pencils. After buying them she had \$10. How much did each pencil cost?
- 3) The sum of three consecutive numbers is 72. What are the smallest of these numbers?
- 4) The sum of three consecutive even numbers is 48. What are the smallest of these numbers?
- 5) You bought a magazine for \$5 and four erasers. You spent a total of \$25. How much did each eraser cost?
- 6) Maria bought seven boxes. A week later half of all her boxes were destroyed in a fire. There are now only 22 boxes left. With how many did she start?
- 7) Sumalee won 40 super bouncy balls playing horseshoes at her school's game night. Later, she gave two to each of her friends. She only has 8 remaining. How many friends does she have?
- 8) Imani spent half of her weekly allowance playing mini-golf. To earn more money her parents let her wash the car for \$4. What is her weekly allowance if she ended with \$12?

9) Aliyah had some candy to give to her four children. She first took ten pieces for herself and then evenly divided the rest among her children. Each child received two pieces. With how many pieces did she start?

10) How old am I if 400 reduced by 2 times my age is 244?

11) Jill sold half of her comic books and then bought sixteen more. She now has 36. With how many did she begin?

12) For a field trip 4 students rode in cars and the rest filled nine buses. How many students were in each bus if 472 students were on the trip?

13) On Tuesday Shanice bought five hats. On Wednesday half of all the hats that she had were destroyed. On Thursday there were only 17 left. How many did she have on Monday?

14) The Cooking Club made some pies to sell at a basketball game to raise money for the new math books. The cafeteria contributed four pies to the sale. Each pie was then cut into five pieces and sold. There were a total of 60 pieces to sell. How many pies did the club make?



# Hands-On Equations: Verbal Problems

NOTES: Example	Variable and Equation Set-Up	Solution and Check
1.) Kayla made the same number of cakes in March and April. In May, she made 4 cakes. If she made a total of 16 cakes in these three months, how many cakes did she make in each of the other two months?	Let _____ = _____ Let _____ = _____	
2.) John and Jack each count the money in their wallets. Jack has three times as much as John. Altogether, they have \$20. How much money does each boy have?	Let _____ = _____ Let _____ = _____	
3.) 5 times a number, increased by 3, is equal to 18. Find the number.	Let _____ = _____	
4.) Three consecutive even integers have a sum of 18. Find the integers.	Let _____ = _____ Let _____ = _____ Let _____ = _____	
5.) John's age is 4 more than 3 times Michael's age. If the sum of their ages is 20, how old are John and Michael?	Let _____ = _____ Let _____ = _____	
6.) Jimmy joined a gym that charges a monthly fee of \$21, plus an entry fee each time he goes for a workout. If he worked-out eight times this month and was charged a total of \$45, how much is the entry fee?	Let _____ = _____	

10. Steven bought 36 ride tickets. The total cost of the tickets is \$9. How much does each ticket cost?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

11. Five statues are in a box that weighs one pound. The total weight is 36 pounds. How much does each statue weigh?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

12. Five envelopes each contain the same amount of money. After \$14 is removed \$36 is left. How much was in each envelope?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

13. Bob wants to deal a deck of 12 cards equally among the players. Each one gets six cards, how many players are there?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

14. Randy has \$36. The amount he has is \$2 more than half the amount his sister has. How much does his sister have?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

15. Moe bought a box of cookies. He had a dozen more at home. When he divides them among six people, each gets 7. How many cookies are in a box?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

16. Sally has \$36. After she buys 12 tapes, she has \$18 left. How much does each tape cost?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

17. A family of 5 gets a \$4 discount on their dinner bill. The total cost is \$36. What would be the cost for each person with no discount?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

18. Nick has some baseball cards, and his brother has  $\frac{1}{3}$  as many as Nick. Together, they have 36. How many cards does Nick have?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_

19. There are 36 members at a club meeting. After some leave there are 27 left. How many members left?

Equation: \_\_\_\_\_

Solve: \_\_\_\_\_



## Writing Equations from Word Problems

*For each word problem, clearly define your variable and set-up an equation/inequality. Solve.*

1. Your friend bought 3 bags of wild bird seed and an \$18 bird feeder. Each bag of birdseed costs the same amount. If your friend spent \$45, find the cost of one bag of birdseed.

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Final Answers: \_\_\_\_\_

2. Wanda earns an hourly wage plus commission at her retail job. Last week, she worked 32 hours and earned a \$65.85 bonus. If her total paycheck, including the bonus, was \$352.25 how much does Wanda make each hour?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Final Answers: \_\_\_\_\_

3. The price of a DVD player today is \$56.60. This is eight dollars less than  $\frac{2}{3}$  the price of the same DVD player in 2005. What was the cost of the DVD player in 2005?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Final Answer: \_\_\_\_\_

4. As a sales person, Harvey earns \$60 per day plus  $\frac{1}{4}$  of his customer sales. If Harvey must earn a total of at least \$147.50 in order to buy a new gaming system, how much must his customer sales be?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Final Answer: \_\_\_\_\_

5. Which equation below could be used to solve the following problem?

Karlie has a collection of quarters, dimes, and nickels that equal \$2.70. If she has 7 quarters and 7 nickels, how many dimes does she have?

A.  $.10d + 7(.25) + 7(.5) = 2.70$

B.  $.10d + 7(.25 + .05) = 2.70$

C.  $10d + 7(25 + 5) = 2.70$

D.  $.10d + 7(.25) + .05 = 2.70$

6. Which equation below could be used to solve the following problem?

The length of a rectangle is  $3\frac{2}{5}$  inches longer than the rectangle's width. If the perimeter of a rectangle is  $9\frac{3}{10}$  inches, what is the width of the rectangle?

A.  $(3\frac{2}{5} + w) = 9\frac{3}{10}$

B.  $2(3\frac{2}{5} + w) = 9\frac{3}{10}$

C.  $(3\frac{2}{5} + w) + w = 9\frac{3}{10}$

D.  $2(3\frac{2}{5} + w) + 2w = 9\frac{3}{10}$

Practice: Writing and Solving Equations From Word Problems

1.) Seventeen more than five times a number is negative twenty-three. What is the number?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

2.) Carol is sixty-six inches tall. This is twenty inches less than two times Mindy's height. How tall is Mindy?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

3.) Three times the sum of two times a number and five is fifty-one. What is the number?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

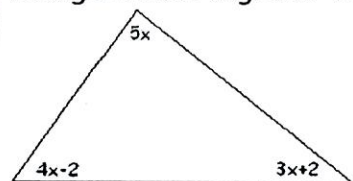
4.) The cost of a family membership at a health club is \$58 per month plus a one-time start up fee of \$129. If a family spent \$651, how many months is their membership?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

5.) The sum of the measures of the angles of a triangle is 180 degrees. Find the value of  $x$ .



Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

6.) The cost of a sweater vest and a blouse is \$57. The sweater vest cost twice as much as the blouse. What is the price of the blouse?

Variables: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

7.) For the animal shelter, Elena purchased five dog leashes for \$9.98 each, five bags of dog food for \$24.99 each and five dog crates for  $x$  dollars each. Which equation could be used to determine Elena's total cost,  $C$ ?

\*Taken from NCDPI 7<sup>th</sup> Grade EOG sample questions.

A.  $5 + \$9.98 + 5 + \$24.99 = C$

B.  $\frac{\$9.98 + \$24.99}{5} = C$

C.  $(\$9.98 + \$24.99 + x)5 = C$

D.  $5 + (\$9.98 + \$24.99 + x) = C$



# Notes - Writing Equations

Name: \_\_\_\_\_ E# \_\_\_\_\_

For each word problem, clearly define your variable and set-up an equation. Solve.

<p>1. Twenty more than three times a number is -4.</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>2. 18.9 decreased by twice a number is equal to 9.9. What is the number?</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>3. Carter had \$14 in his bank account before putting in his birthday earnings. He now has \$98. How much money did he earn at his birthday?</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>4. Corina spent \$78 on three pairs of sandals for the summer. If each pair of sandals cost the same amount, write an equation that represents this situation and solve to find the cost of one pair of sandals.</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>5. Your friend bought 5 bags of wild birdseed and a \$16.50 bird feeder. Each bag of birdseed costs the same amount. If your friend spent \$59, find the cost of one bag of birdseed.</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>

<p>6. Grace earns \$18 for vacuuming and dusting her house. She spends \$4 on lunch and \$9 on a new dress. Write and solve an equation to show how much money Grace has left.</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>7. Dylan had a bag of gumdrops that he divided equally among his four friends. If each friend receives 56 gumdrops, how many gumdrops did he start with?</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>8. Kate has 67 apps on her iPad. This is 4 more than 3 times the amount Kaela has. How many apps does Kaela have on her iPad?</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>9. Tyler and Sahil each purchased new baseball hats for practice. Sahil's hat cost 3 times as much as Tyler's hat did. Together, they spent \$56. How much did each boy spend?</p>	<p>Variable: _____</p> <p>_____</p> <p>Equation: _____</p> <p>Solutions: Tyler: _____ Sahil: _____</p>
<p>10. Create a word problem to model the equation.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Variable: _____</p> <p>Equation: <math>3x - 17 = 50</math></p> <p>Solution: _____</p>

## Homework Practice: Setting-Up and Solving Equations from Word Problems

For each problem, set-up a variable and equation and then solve.

1. Twenty more than three times a number is -4

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

2. 18.9 decreased by twice a number is equal to 9.9. What is the number?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

3. Your friend bought 5 bags of wild bird seed and a \$16.50 bird feeder. Each bag of birdseed costs the same amount. If your friend spent \$59, find the cost of one bag of birdseed.

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

4. Jenna has 67 stuffed animals. This is 4 more than 3 times the amount Kayla has. How many stuffed animals does Kayla have?

Variable: \_\_\_\_\_

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

5. Solve:

$$-17 - 3x = -50$$

6. Solve:

$$171 = -9x - (-99)$$



For each word problem, clearly define your variable and set-up an equation. Solve.

<p>11. Your friend bought 3 bags of wild birdseed and an \$18 bird feeder. Each bag of birdseed costs the same amount. If your friend spent \$45, find the cost of one bag of birdseed.</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>12. Megan earns an hourly wage plus commission at her retail job. Last week, she worked 32 hours and earned a \$65.85 bonus. If her total paycheck, including the bonus, was \$352.25 how much does Megan make each hour?</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>13. The price of a DVD player today is \$56.60. This is eight dollars less than <math>\frac{2}{3}</math> the price of the same DVD player in 2005. What was the cost of the DVD player in 2005?</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>14. As a sales person, Ryan earns \$60 per day plus <math>\frac{1}{4}</math> of his customer sales. If Ryan must earn a total of at least \$147.50 in order to buy a new gaming system, how much must his customer sales be?</p>	<p>Variable: _____</p> <p>Equation: _____</p> <p>Solution: _____</p>
<p>15. Avni has a collection of quarters, dimes, and nickels that equal \$2.70. If she has 7 quarters and 7 nickels, how many dimes does she have?</p>	<p>Which equation below could be used to solve the following problem?</p> <p>A. <math>.10d + 7(.25) + 7(.5) = 2.70</math></p> <p>B. <math>.10d + 7(.25 + .05) = 2.70</math></p> <p>C. <math>10d + 7(25 + 5) = 2.70</math></p> <p>D. <math>.10d + 7(.25) + .05 = 2.70</math></p>