

6.1 Equations with Like Terms

NOTES

MATH 7

Write your
questions here!



One of the best ways to solve equations is by _____

_____ are terms whose variables are the same.

Review: How do we combine like terms? (You can Rewatch lesson 4.2 if you forgot!)

Example 1: $2a + 3b - 4a - 7b$

Example 2: $-19 - 3x + x + 19$

You try these two:

Example 3: $y - 12 + 43 - 5y$

Example 4: $-2w + 7g + 2w - 7g$

How can Combining Like Terms help us when solving equations?

Example 5: $4x + 3x + 5 = 26$

Example 6: $6 + 2d + 6d = 18$

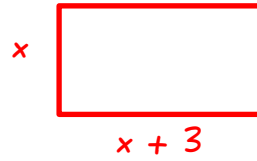
Example 7: $-15 = 5 - 8 - 4h$

Example 8: $6 + 2y + 4 - 3y = -10$

Let's Word-Problem it up!

Example 9

Find each side if the perimeter is 26 .



SUMMARY:

Now,
summarize
your notes
here!



6.1 Equations with Like Terms

PRACTICE

Solve the following equations. **SHOW ALL STEPS!!!!**

1. $2x + 3x = 10$

2. $7x - 3x = 8$

3. $3t + 2 + 5 = 16$

4. $-8 = 2 + 4y + y$

5. $9 = 4m - 3 + 2m$

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

$$7. \quad p + 3p = -16$$

$$8. \quad 15 = -3d - 2d$$

$$9. \quad 8 - 2x + 8 - 2x = 20$$

$$10. \quad 2x - 4 - x = -8$$

$$11. \quad -8 = -10 - 3f + 2$$

$$12. \quad -400n = 1000 - 200$$

MIXED REVIEW. Solve the following one-step and two-step equations.

$$13. \quad 6 = 2 - 4y$$

$$14. \quad -2 = \frac{t}{5}$$

$$15. \quad \frac{x}{3} - 3 = 7$$

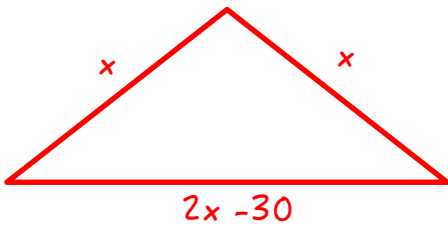
Solve the following equations. SHOW ALL STEPS!!!!

$$16. \quad -8 = 2 + 2y - 12$$

$$17. \quad 4y + y + 1 = -9$$

For number 18, write an equation to model the situation and then solve it!

18. The perimeter of the triangle below is 90 inches. Find the value of x . Then, find each side.



Equation:

Answer:

EXIT TICKET

Mr. Brust definitely did this one wrong. Bummer. Circle his mistake, explain why it's wrong, and then solve it correctly. Thanks!

$$6p - 8p + 2 = 30$$

$$-14p + 2 = 30$$

$$\underline{-2} \quad \underline{-2}$$

$$-14p = 28$$

$$\underline{-14} \quad \underline{-14}$$

$$p = -2$$

6.2 Equations using the Distributive Property

NOTES

MATH 7

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questions here!



Another tool for solving equations is by using the _____

We might also have to _____.

Review: How do we use the distributive property?

Example 1: $-2(4x - 7)$

Example 2: $-7(2x + 3)$

Now let's Solve Equations!

Example 3: $5(2x - 3) = -35$

Example 4: $2(3 - 8x) = 22$

What? *AND COMBINE LIKE TERMS?!?!?!?*

Example 5: $4(2x - 5) + 3x = 2$

Example 6: $6 - 10(d - 4) = 16$

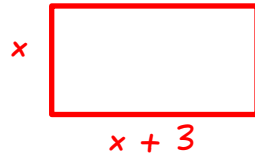
Example 7: $10 - 3(2x - 1) = -11$

Example 8: $\frac{1}{2}(12x - 14) + 1 = -24$

Let's Word-Problem it up!

Example 9

Use the distributive property to find x if the perimeter is 26 .



SUMMARY:

Now,
summarize
your notes
here!



6.2 Equations using the Distributive Property

PRACTICE

Solve the following equations. **SHOW ALL STEPS!!!!**

1. $4(x - 3) = 20$

2. $-42 = 6(3y - 5)$

3. $3t + 2t + 4 = 39$

$$4. \quad 3n + 2(n - 5) = 35$$

$$5. \quad 40 = 4 + 3(5v + 2)$$

$$6. \quad 40 = -4(4p - 3) + 2p$$

$$7. \quad 1.2p + 3.5(p - 2) = -21.1$$

$$8. \quad 5 = \frac{1}{3}(d - 6) + 1$$

$$9. \quad 2(3x - 4) + 10 - 2x = -22$$

MIXED REVIEW.... Keeping it Real. Real Easy.

$$10. \quad 6 - 3b = -9$$

$$11. \quad \frac{x}{3} - 3 = 6$$

$$12. \quad -\frac{4}{3}n = 12$$

13. Solve the following equation:

$$37 = 8v + 3(5v - 3)$$

14. Mr Sullivan and Mr. Brust solved these equations different ways. Who solved it correctly?

Solve: $3(4x - 1) = 33$

Mr. Brust's work:

$$\begin{aligned} 3(4x - 1) &= 33 \\ 12x - 3 &= 33 \\ \hline +3 &+3 \\ \frac{12}{12}x &= \frac{36}{12} \\ x &= 3 \end{aligned}$$

Mr. Sullivan's work:

$$\begin{aligned} \cancel{3}(4x - 1) &= \frac{33}{3} \\ 4x - 1 &= 11 \\ \hline +1 &+1 \\ \frac{4x}{4} &= \frac{12}{4} \\ x &= 3 \end{aligned}$$

Solve the following equations WITHOUT using the distributive property. (Like Mr. Sullivan did!)

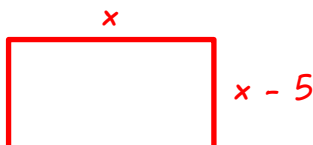
15. $4(x - 3) = 40$

16. $6 = \frac{1}{4}(d - 2)$ (hint: Multiply each side by 4, first!)

EXIT TICKET

Write an equation to model the situation using the distributive property and then solve it!

Find each side length if the perimeter of the rectangle below is 94 inches.



Equation:

Answer:

6.3 More Modeling with Equations

NOTES

Math 7

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Ex 1: Find an equation and solve for each of the situations below

Twice the sum of a number and eleven is 4. Find the number.

Six less than the sum of twice a number and three times a number is equal to 39.

Ex 2: The sum of three consecutive integers is 153. Find each integer.

What is the unknown value in this situation? What would be a good variable to use for it?

What's an equation to model this situation? Solve it. Make sure you include units that describe your answer.

Ex 3: Sully loves Lebron. He sets up a store that sells shirts claiming Lebron is better Jordan. Suppose Sully recently had a sale and took $\frac{1}{5}$ off of each shirt he sold. That made Mr. Brust purchase a shirt, which cost him 32 dollars. What was the original cost of the shirt?

Find a model for the situation, define its variable and solve it.

WHO WAS
BETTER...

LEBRON

OR

MJ ?

FOR CONSECUTIVE
INTEGERS, USE:

N
N + 1
N + 2
ETC.

Ex 4: The width of a rectangle is 4 ft less than its length. Find each side of the rectangle if the perimeter equals 168 ft.

Find a model for the situation, define its variable and solve it.

DON'T DENY IT...YOU REALLY WANNA TRY IT!

Ex 5 Mr. Brust wants to sell mini-pizzas at lunch to make money for his new break-dancing Club. He is going to sell each Pizza for $\frac{1}{4}$ more than he bought it for. If Mr. Bean buys a mini Pizza for \$6.00, how much did that mini-pizza cost Mr. Brust?

Find a model for the situation, define its variable and solve it.

SUMMARY:

Now,
summarize
your notes
here!



PRACTICE

6.3 More Modeling with Equations

Directions: Circle the equation that best fits the given situation. Then SOLVE the equation.

1) Adding 1 to twice the sum of a number and 8 is -19 .
What's the number?

a. $2n + 8 + 1 = -19$

c. $2(n + 8 + 1) = -19$

b. $2(n + 8) + 1 = -19$

d. $2n + (8 + 1) = -19$

Solution:

2) Twice the sum of a number and nine times that number is 100. What's the number?

a. $2n + 9n = 100$

c. $2(n + 9n) = 100$

b. $2n + (9 + n) = 100$

d. $2(n + 9n) = 100$

Solution:

3) Mr. Bean sells a can of his beans half-off. The cost of the beans after the discount is \$4. How much are the beans normally?

a. $c + \frac{1}{2}c = 4$

c. $\frac{1}{2}c - c = 4$

b. $c - \frac{1}{2}c = 4$

d. $\frac{1}{2}(c) = 4$

Solution:

4) Sully sells his shirts after adding $\frac{1}{4}$ of the price and an additional 2 dollars for shipping. If you ordered a shirt and it cost you 42 dollars including shipping, how much did it cost Sully?

a. $s + \frac{1}{4}s + 2 = 4$

c. $\frac{1}{2}s - s + 2 = 4$

b. $s - \frac{1}{2}s + 2 = 4$

d. $\frac{1}{2}(s) + 2 = 4$

Solution:

Directions: For each situation make an equation, define your variables and solve your equation.

5) The sum of three consecutive integers is -39 . Find the three integers.

Equation:

Answer:

6) Mr. Brust takes a lot of naps during the summer. Last summer, Brust took 76, which is $\frac{1}{3}$ times more than the previous summer. How many naps did Brust take that previous summer?

Equation:

Answer:

7) Mr. Kelly takes $\frac{1}{10}$ th of the score off of any Unit test that is taken late. If a student who takes a test late received a final grade of 72, what score would the student have received if the test was on time?

Equation:

Answer:

8) The length of a rectangle is 7 cm more than the width. Find the length of each side of the rectangle if the perimeter is 58 cm .

Equation:

Answer:

Directions: For each situation make an equation, define your variables and solve your equation.

1) Four times the sum of 3 consecutive numbers is 912. Find the three numbers.

Equation:

Answer:

2) Mr. Brust decides to sell regular size pizzas for his break-dancing club. To the cost of each pizza, he adds one dollar per topping and then charges 5 dollars to deliver the order.

- a. Mr. Bean orders 3 large pizzas, each with 2 toppings, and has them delivered for \$42.50. Define your variables. Then, write and solve an equation to find the cost of a large pizza.

- b. Brust decides he needs to increase the price of his toppings. Mr. Bean then orders 2 large pizzas, each with 3 toppings, and has them delivered for \$33.50. Using your answer from part (a), define your variables, write and solve an equation to find the new cost of the toppings.

EXIT TICKET –

Below are two POSSIBLE scenarios for the given model. For each explain WHY or WHY NOT each situation would be a possible scenario for the equation.

$$2(x + 3) + 2x = 54$$

Scenario #1: For Valentine's day, the Glee Club will sing a special song to your Valentine for a certain price. For 3 extra dollars, they will also dance. Sully orders 4 Valentines, two of them with a dance, for \$54.

Scenario #2: A rectangle has a length that is 3 longer than its width. The perimeter is 54.

Solve the following equations. **SHOW ALL STEPS!!!!**

1. $\frac{2x}{5} = -32$

2. $-8 = -15 + y$

3. $9h + 2 = -88$

4. $10x - 3x + 1 = 29$

5. $9 = m - 3 + 2m$

6. $10 + 3x + 8 = 39$

7. $3 + 2(n - 5) = 13$

8. $44 = 4v + 3(5v + 2)$

9. $-40 = 4(4p - 3) - 2p$

10. $2.4p + 7(p - 2) = -42.2$

11. $5 = \frac{1}{3}(d - 18) + 1$

12. $4x - 2(x - 5) + 1 = 11$

Directions: Circle the equation that best fits the given situation. Then SOLVE the equation.

1) Four less than twice the sum of a number and 3 is -12 .
What's the number?

a. $2n + 3n - 4 = -12$

c. $2(n + 3 - 4) = -12$

b. $2(n + 3) - 4 = -12$

d. $4 - 2(n + 3) = -12$

Solution:

2) Mr. Kelly takes $\frac{1}{5}$ th of the score off of any Unit test that is taken late. If a student who takes a test late received a final grade of 72, what score would the student have received if the test was on time?

a. $s + \frac{1}{5}s = 72$

c. $s - \frac{1}{5}s = 72$

b. $s + \frac{1}{5} = 72$

d. $s + \frac{1}{5} = 72$

Solution:

3) The sum of three consecutive integers is -102 . Find the three integers.

Define Variable :

Equation:

Answer : _____

4) Mr. Bean sells bottles of beard oil for a hobby. Currently, you can buy a bottle $\frac{1}{4}$ off the original price for 12 dollars. How much is the original price?

Define Variable :

Equation:

Answer : _____

5) The length of a rectangle is 12 *cm* more than the width. Find the length of each side of the rectangle if the perimeter is 92 *cm*.

Define Variable :

Equation:

Answer : _____