

# 5.1 One Step Equations

## NOTES

Math 7

Write your  
questions here!



1)  
Verbal

2)  
Verbal

Opposite

Opposite

Solution

Solution

Let's Try Another Way!

3)  
What operation is bothering  
the variable?

What is the inverse of that operation?

Don't Forget to CHECK IT YO!

BRING IT UP A NOTCH  
Solve AND CHECK

4)

5)

YOU TRY!!!

6)

7)

## 5.1 One Step Equations

# PRACTICE

**Directions: For each equation, write a verbal translation, the opposite operation, and find the solution.**

1)  $h + 6 = 8$

Verbal:

Opposite:

Solution:

2)  $b - 3 = 5$

Verbal:

Opposite:

Solution:

3)  $2n = 6$

Verbal:

Opposite:

Solution:

**Directions: Solve and check each equation.**

4)  $8 = k - 5$

5)  $\frac{b}{8} = -3$

6)  $16 = -4v$

7)  $1.2 = \frac{t}{3}$

8)  $5 + m = -8$

9)  $-3g = -15$

10)  $-6 = -8 + j$

11)  $18 = -a$

12)  $-5.2 = n - 1.4$

13)  $h + 6 = 8$

14)  $-8 + k = -8$

15)  $-10 = \frac{y}{3}$

**Directions: Sully solved the following. Check his solution to see if it is correct. If incorrect, find the correct solution.**

<p>16) Sully says <math>h = 4</math></p> $5h = -20$	<p>17) Sully says <math>n = -4</math></p> $0.25n = 8$
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**Directions: Brust solved the following equations. He DEFINITELY made some mistakes! Using complete sentences explain his mistake and then find the correct solution.**

<p>18)</p> $\begin{array}{r} h + 5 = -4 \\ +4 = +4 \\ \hline h + 9 = 0 \\ h = 9 \end{array}$	<p>19)</p> $\begin{array}{r} 2 + x = -10 \\ +2 = +2 \\ \hline x = -8 \end{array}$
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## 5.1 One Step Equations

## WRAP UP

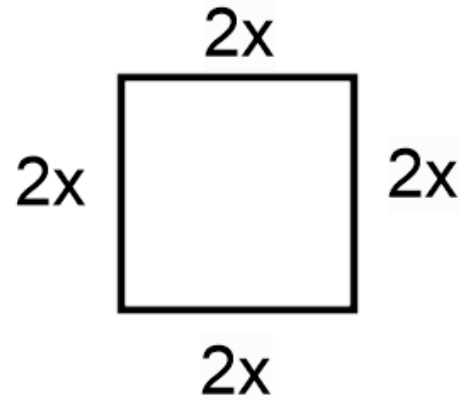
<b>Directions: Write a verbal translation, opposite operation, and find the solution for the equation.</b>	<b>Solve and check each equation.</b>	
<p style="text-align: center;"><math>4g = 12</math></p> <p>1) Verbal:</p>  <p>2) Opposite:</p>  <p>3) Solution:</p>	<p>4) <math>8.5 + y = 4.75</math></p>	<p>5) <math>-5x = 45</math></p>

6) The perimeter of the square shown below is 64 meters.

**Part A**

Which equation represents the perimeter of the square?

- (A)  $2x = 64$
- (B)  $4x = 64$
- (C)  $8x = 64$
- (D)  $16x = 64$



**PART B**

Solve the equation.

7) Mr. Brust and Mr. Sullivan were originally competitors when they first met in Oxford, Ohio. They sold hacky sacks in the quad of Miami University. That fall, Mr. Brust sold 32 hacky sacks and made \$168. Mr. Sullivan sold 48 hacky sacks for \$156.

- a) What are unknowns in this situation?
- b) Write an equation for Mr. Brust and another one for Mr. Sullivan that models their situation.
- c) Who sells their hacky sacks for more money? How much more?

**EXIT TICKET –**

Sully and Brust love playing a game they learned in Ohio, called Cornhole. It is a lot like tossing bean bags at a target far away, but the bags are filled with kernels of corn. Every bag,  $b$ , weighs 10.5 ounces. How many bags are there if the total weight is 126 ounces?

Pick all the equations below that could represent the situation.

■  $126b = 10.5$

■  $10.5b = 126$

■  $b = \frac{126}{10.5}$

■  $\frac{10.5}{126} = b$

# 5.2 Two Step Equations

### ALGEBRA 2

Write your  
questions here!



Identify what operations are being performed on the variable.

1)

2)

Grouping  
Exponents  
Multiply  
Divide  
Add  
Subtract

No time to rest on the job! Let's solve this equation!

3)

Solve and check!

4)

5)

YOU TRY!!!!

6)

## SUMMARY:

Now,  
summarize  
your notes  
here!



## 5.2 Two Step Equations

## PRACTICE

**Directions: Circle all the operations that are being performed on the variable. Indicate the number performing each operation. Do NOT solve the equation!**

1)  $12.5 = 2.3x - 8.7$

Grouping  
Exponents  
Multiply  
Divide  
Add  
Subtract

2)  $\frac{x}{3} + 5 = 10$

Grouping  
Exponents  
Multiply  
Divide  
Add  
Subtract

3)  $17 - x = 15$

Grouping  
Exponents  
Multiply  
Divide  
Add  
Subtract

**Directions: Solve and check.**

4)  $-13.61 = \frac{b}{3.4} - 9.11$

5)  $6x - 14 = -2$

6)  $-2 = 5 - \frac{m}{3}$

7)  $-13.27 = -2.2 - 4.1h$

8)  $10 - 8x = 18$

9)  $\frac{k}{2} + 12 = 7$

10) $5 - v = -12$	11) $7f + 8 = -13$	12) $9 = 12 - \frac{g}{4}$
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**Directions: Sully solved the following. Check his solution to see if it is correct. If incorrect, find the correct solution.**

13) Sully says $n = 8$ .  $4 + \frac{x}{4} = 2$	14) Sully says $n = -3$ .  $-8 = -2 + 2n$
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**Directions: Brust solved the following equations. He DEFINITELY made some mistakes! Using complete sentences explain his mistake and then find the correct solution.**

15)  $\begin{array}{r} 8 - 2x = -10 \\ -8 \quad = -8 \\ \hline 2x = -18 \\ 2 = 2 \\ \hline x = -9 \end{array}$	16)  $\begin{array}{r} 5x - 3 = 12 \\ +3 = +3 \\ \hline 5x = 15 \\ -5 = -5 \\ \hline x = 10 \end{array}$
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## 5.2 Two Step Equations

## WRAP UP

<b>Directions: Circle all the operations that are being performed on the variable. Indicate the number performing each operation.</b>	<b>Directions: Solve and check.</b>
1) <u>G</u> rouping <u>E</u> xponents <u>M</u> ultiply <u>D</u> ivide <u>A</u> dd <u>S</u> ubtract	2) $5 - \frac{b}{2} = 1$

3) Translate each of the following into a mathematical equation.

a. Four times an unknown number,  $y$ , plus eight equals twelve.

b. Fifteen is the same as the sum of 5 and twice an unknown number,  $g$ .

c. Brust starts with two oranges in his grove. He gains three more oranges every day. How many days until he has 22 oranges?

4) The perimeter of the rectangle shown below is 66 meters.

**Part A**

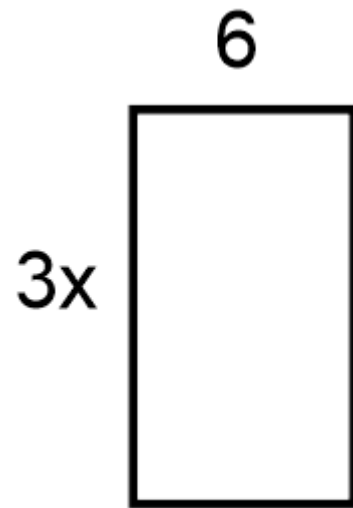
Which equation represents the perimeter of the rectangle?

(A)  $3x + 6 = 64$

(B)  $6x + 6 = 64$

(C)  $6x + 12 = 64$

(D)  $9x + 12 = 64$



**PART B**

Solve the equation.

**EXIT TICKET –**

Mr. Brust solves his equations really WONKY. Look below and first describe what Mr. Brust did first. Then decide if he still got the correct answer.

$$\begin{aligned} & \left( -2 = 5 - \frac{m}{3} \right) 3 \\ & -6 = 15 - m \\ & \begin{array}{r} -15 \quad -15 \\ \hline -21 = -m \\ \hline \frac{-21}{-1} = \frac{-m}{-1} \\ \hline 21 = m \end{array} \end{aligned}$$



# 5.3 Equations with Grouping

Math 7

Write your questions here!



1)

2)

G  
E  
M  
D  
A  
S

You try one!

3)

4)

The Right Group is Important

5)

G  
E  
M  
D  
A  
S

Last one...you try on your own! Pause the video!

6)

-

## SUMMARY:

Now, summarize your notes here!



## 5.3 Equations with Grouping

# PRACTICE

Directions: Brust solved the following equations. He DEFINITELY made some mistakes! Using complete sentences explain his mistake and then find the correct solution.

1)

$$\begin{array}{r} \frac{2}{3}(g+8) = 6 \\ \hline 2\left(\frac{2}{3}(g+8)\right) = 6(2) \\ \hline \frac{3(g+8) = 12}{3} = 3 \\ \hline g+8 = 4 \\ -8 = -8 \\ \hline g = -4 \end{array}$$

2)

$$\begin{array}{r} \frac{f-7}{3} = -5 \\ \hline 3\left(\frac{f-7}{3}\right) = 3(-5) \\ \hline f+7 = -15 \\ -7 = -7 \\ \hline f = -22 \end{array}$$

Directions: Solve and check.

3)  $10 = \frac{5}{3}x$

4)  $\frac{1}{4}x - 10 = -7$

5)  $\frac{k-4}{2} = -7$

6)  $-3(n+10) = -9$

7)  $\frac{3}{4}x - 20 = -11$

8)  $-16 = 4(p-2)$

**Directions: Solve and check.**

9)  $10 - \frac{2}{9}x = 6$

10)  $9 = \frac{14+f}{3}$

11)  $\frac{p-6}{5} = -3$

**Directions: Sully solved the following. Check his solution to see if it is correct. If incorrect, find the correct solution.**

13) Sully says  $n = 3$

$$8 = \frac{2}{3}n + 6$$

14) Sully says  $n = 25$ .

$$\frac{5-n}{2} = 10$$

## 5.3 Equations with Grouping

## WRAP UP

**Directions: Solve and check.**

1)  $4 - \frac{3}{2}x = 22$

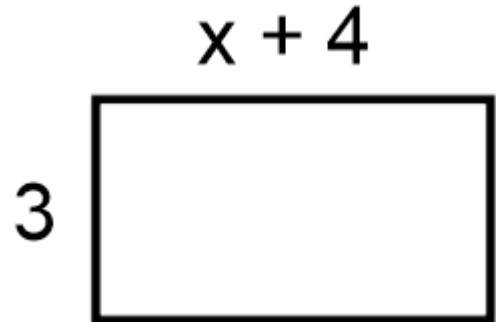
2)  $4(g + 5) = -24$

3) The area of the rectangle shown below is 24 meters squared.

**Part A**

Which equation represents the area of the rectangle?

- (A)  $3x + 4 = 24$
- (B)  $2x + 14 = 24$
- (C)  $3(x + 4) = 24$
- (D)  $x + 12 = 24$



**PART B**

Solve the equation.

**PART C**

Fill in the box with the correct dimensions of the rectangle.

3 meters by  meters

**EXIT TICKET –**

Use the equation below and determine which of the given situations could be modeled by the equation.

$$2(x + 5) = 20$$

- Twice the sum of a number and 5 is 20.
- The sum of twice a number and 5 is 20.
- Mr. Brust has \$5 to start the week. His kids give him some money to end the week. The following week he doubles the total and has \$20. How much did his kids give him?
- Mr. Brust starts with \$5 and gets \$2 more every day. How many days until he has \$20?

# 5.4 Modeling with Equations

## NOTES

### Math 7

Write your  
questions here!



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

Twice the sum of a number and eleven is 24.

The sum of twice a number and eleven is 24.

**Ex 2: Mr. Kelly LOVES model airplanes. He went to the store and bought three new model airplanes for \$5.95 each and some glue to put them together. All total he spent \$22.50.**

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: Brust is struggling to keep his dogs in his rectangular shaped yard so he wants to build a wall. He knows the perimeter of his yard is 46 meters and the width is 8 meters. What is the length of his yard?**

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

**YOU TRY!**

**Ex 4: Mr. Brust has his children collect oranges from his backyard. He gives them \$0.75 to start and then pays them \$0.35 for each orange they bring back. One day Mr. Brust had to pay one of his children \$17.55. How many oranges did they bring back?**

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

## SUMMARY:

Now,  
summarize  
your notes  
here!

### 5.4 Modeling with Equations

## PRACTICE

Directions: Circle the equation that best fits the given situation. Then SOLVE the equation.	
<p>1) The sum of a number divided by 4 and 8 is 12. What's the number?</p> <p>a. <math>\frac{n}{4} + 8 = 12</math>                      c. <math>\frac{n+4}{8} = 12</math></p> <p>b. <math>\frac{4}{n} + 8 = 12</math>                      d. <math>\frac{n+8}{4} = 12</math></p> <p>Solution:</p>	<p>2) The sum of a number and 8 divided by 4 is 12. What's the number?</p> <p>a. <math>\frac{n}{4} + 8 = 12</math>                      c. <math>\frac{n+4}{8} = 12</math></p> <p>b. <math>\frac{4}{n} + 8 = 12</math>                      d. <math>\frac{n+8}{4} = 12</math></p> <p>Solution:</p>
<p>3) Seven is the same as the sum of four times a number and 5. What's the number?</p> <p>a. <math>7 = 5h + 4</math>                      c. <math>7 = 4(h + 5)</math></p> <p>b. <math>7 = 5(h + 4)</math>                      d. <math>7 = 4h + 5</math></p> <p>Solution:</p>	<p>4) Mr. Kelly has \$60 and steadily loses \$2 every hour. How many hours until he has only \$12 left in his wallet?</p> <p>a. <math>2x + 60 = 12</math>                      c. <math>2x - 60 = 12</math></p> <p>b. <math>60 - 2x = 12</math>                      d. <math>-60 - 2x = -12</math></p> <p>Solution:</p>
<p>5) Mr. Brust needs to rent a car after busting up his on the bumpy Italian roads. He needs to pay \$25 for insurance and \$40 a day. How many days can he rent the car if he only has \$225.</p> <p>a. <math>40d + 25 = 225</math>                      c. <math>25d + 40 = 225</math></p> <p>b. <math>40(d + 25) = 225</math>                      d. <math>25(d + 40) = 225</math></p> <p>Solution:</p>	<p>6) Ted Mosby currently has \$400. He plans on finding some more money this weekend. On Monday, he is going to give each of his three friends an equal share of his money. How much more money did he gain over the weekend if each friend gets \$300 each.</p> <p>a. <math>\frac{m}{3} - 400 = 300</math>                      c. <math>3m - 400 = 300</math></p> <p>b. <math>3m + 400 = 300</math>                      d. <math>\frac{400+m}{3} = 300</math></p> <p>Solution:</p>

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

7) Ross Geller starts a moving company to get couches up stairwells. He charges a flat rate of \$10 and then \$3.50 for each flight of stairs he moves the couch up. How many flights of stairs did he move up a couch if he made \$94?

**Equation:**

**Answer:**

8) Michael Scott is a GREAT boss! He agrees to TRIPLE the amount of money that Dwight and Jim raise for their favorite charity. Dwight raised \$145 and they are hoping to raise \$1500 overall. How much did Jim raise by himself?

**Equation:**

**Answer:**

9) Leslie Knope goes to the Pawnee flea market to sell copies of her book. The flea market charges her \$10 to open up the table, but she makes \$12.75 for every book. How many books does she need to sell to make \$500?

**Equation:**

**Answer:**

10) When Michael Jordan retired he spent time as a water boy for the Cleveland Cavaliers. One day he was preparing for their upcoming road trip. He had 8 bottles left over from last trip. He knows he can buy cases of water to save money. Each case has 12 bottles of water. How many cases of water does he need to buy to have 200 bottles of water for the trip?

**Equation:**

**Answer:**

11) Natasha Romanov and Clint Barton are running low on arrows and are preparing for the next big Avengers trip. Natasha knows that they will need twice as many as they have currently. If Clint has 14 on him, how many does Natasha have if they need 70 total arrows for the trip?

**Equation:**

**Answer:**

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

1) Monica Geller is busy cooking up for a big catering job this weekend. The host agrees to pay Monica \$75 up front and then will pay her \$9.50 for every person eating. How many people did Monica cook for if she made \$673.50 for the job?

**Equation:**

**Answer:**

2) Below is an equation that could model MANY different scenarios. Make up a scenario in which the given model would make sense and write it in complete sentences. Then solve to find your solution.

$$300 = 7x + 13$$

### 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.

$$36 = 2(x + 10)$$

Scenario #1: Brust is going to double the number of quarters that Mr. Kelly and Mr. Sullivan have in their pockets. Mr. Kelly has 10 quarters and Brust knows that he'll need 36 total quarters. How many quarters does Mr. Sullivan have?

Scenario #2: Mr. Bean has 10 students in class and gets two more kids every week. How many weeks until Mr. Bean has 36 students?



# Unit 5 Review: Equations

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NAME: \_\_\_\_\_

Period: \_\_\_\_\_

**Directions: Solve each equation.**

1)  $6x = -24$

2)  $\frac{y}{4} = 5$

3)  $5 - g = 7$

4)  $3m - 6 = 12$

5)  $4(x - 5) = -8$

6)  $\frac{p-2}{2} = -6$

**Directions: Solve each equation.**

7)  $10 - 6x = -2$

8)  $-3 = \frac{2}{3}p + 5$

**Directions: Write a verbal translation, model the situation and find the solution for the equation.**

9)  $y + 9 = 5$

**a. Verbal:**

**b. Solution:**

**Directions: For the situation make an equation, define your variable and solve your equation.**

10) Robin works for the news channel CSN. She loves breaking new stories. So far this year she's broken 12 new stories. Every month she breaks 3 new stories. How long until she breaks 24 stories?