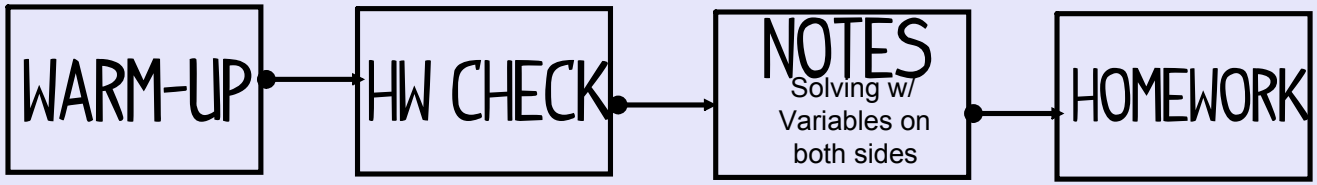
SOLVING MULTI-STEP EQUATIONS WITH VARIABLES ON BOTH SIDES



WARM-UP

Distribute, Simplify, Combine Like Terms:

1. $3x + 4 - x + 4$

$2x + 8$

2. $-(d^2 - 5d) - 2(d^2 + 3d) + 12$

$-d^2 + 5d - 2d^2 - 6d + 12$

$-3d^2 - d + 12$

3. Sally earns $200 per week plus a 20% commission of her sales. Write an expression for her total earnings if she sells d dollars worth of merchandise.

$200 + .20d$

HOMEWORK CHECK

Answers:

1. $x = 3$
2. $y = -1$
3. $a = 6$
4. $x = -4$
5. $-8 = 5$, so no solution, $\varnothing$
6. $x = -\frac{4}{3}$
7. $y = 3$
8. C
9. $x = 9$ ft
10. $w = 35$ m; $l = 40$ m
11. $w = 26$ cm; $l = 4$ cm
12. $x = 14$
    m<A = 58°
    m<B = 56°
    m<C = 66°
13. $x = 20$
    m< = 75°
    m< = 15°
14. $x = 11$
    First side = 3 m
    Second side = 11 m
    Third side = 12 m

Algebra I - Unit 1: Topic 2 – Solving Multi-Step Equations with Distribution

Practice - Solving Multi-Step Equations with Distribution pp 92-97

Name _____ Date _____ Per _____

Solve the following equations, then check your solution.

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

2. $3(2y+6)=12$

3. $5(3a-7)-9=46$

4. $4+6(x-3)=-38$

5. $4(3n-2)-12n=5$

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

7. $\frac{3}{2}=\frac{12}{3y-1}$

8. Which equation below represents the second step of the solution process?

Step 1 $6-3(5x+2)-10x=50$

Step 2 [ ]

Step 3 $-25x=50$

Step 4 $x=-2$

A $6-15x+6-10x=50$
B $6-15x+2-10x=50$
C $6-15x-6-10x=50$
D $3(5x+2)-10x=50$

Draw a picture, set up an equation, and then solve.

9. The perimeter of a square is 68 feet. If each side is $(2x-1)$ feet, find x.

Algebra I - Unit 1: Topic 2 – Solving Multi-Step Equations with Distribution

Draw a picture, define the variable, set up an equation, and then solve.

10. The length of a rectangle is 5 m greater than the width. The perimeter is 150 m. Find the width and length.

11. The width of a rectangle is 2 cm less than 7 times the length. The perimeter is 60 cm. Find the width and length.

12. Given ΔABC with $m\angle A = (2x + 30)^\circ$, $m\angle B = (4x)^\circ$, and $m\angle C = (2(2x + 5))^\circ$. Solve for x and then find the measure of each angle.

180 2(14)+30 14 14

$2x+30+4x+2(2x+5)=180$

$2x+30+4x+4x+10=180$

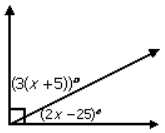
$10x+40=180$

$-40 \quad -40$

$\frac{10x=140}{10 \quad 10}$

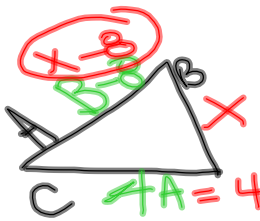
$x=14$

13. Use the diagram to set up an equation and solve for x and then find the measure of each angle.



$3(x+5)+2x-25=90$

14. The first side of a triangle is 8 m shorter than the second side. The third side is 4 times as long as the first side. The perimeter is 26 m. Find the length of each side.



$A=4(x-8)$

$A+B+C=26$

$x-8+x+4(x-8)=26$

$2x-8+4x-32=26$

$6x-40=26$

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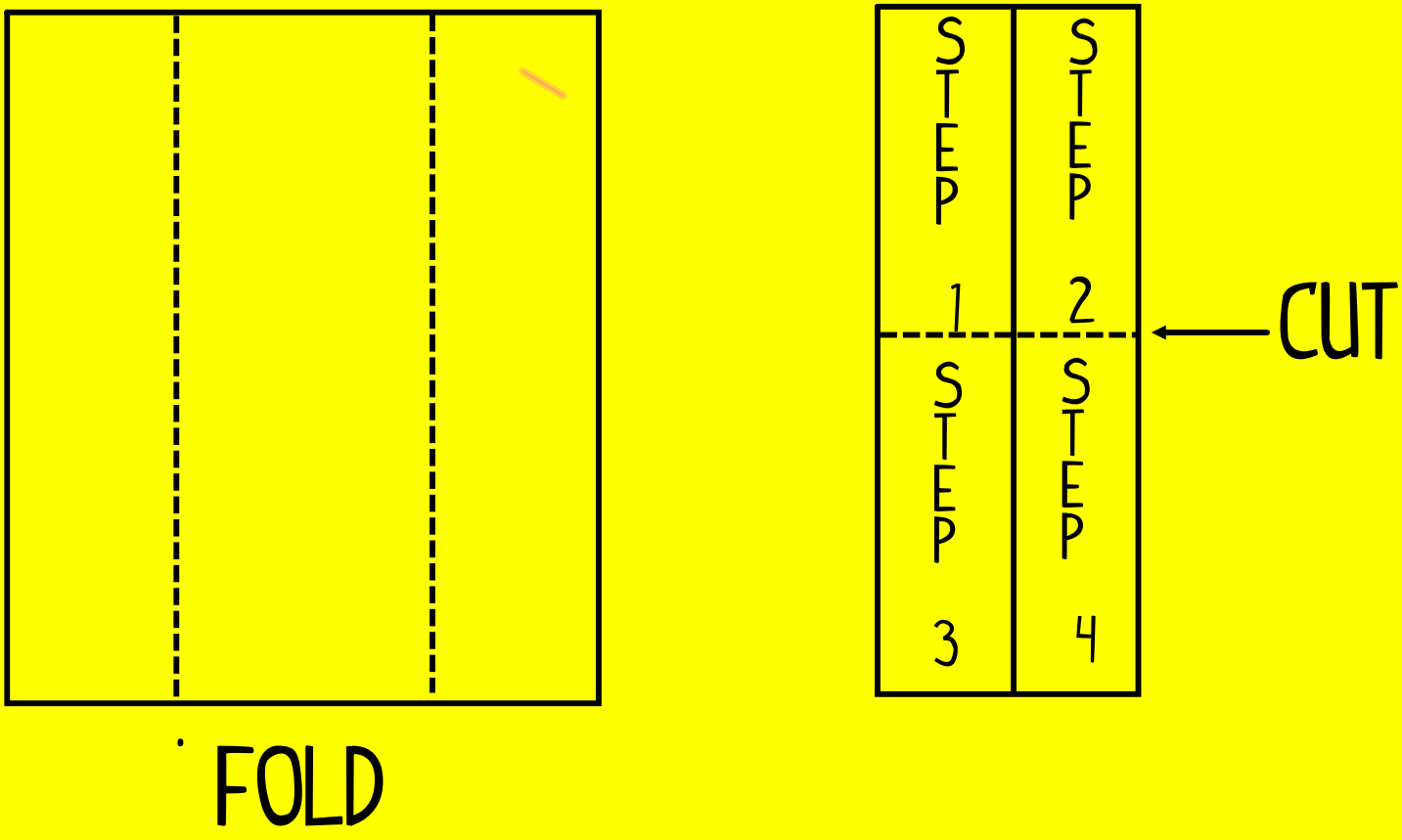


HOW TO SOLVE A MULTI-STEP EQUATION p.13

$4+2x=-5-x$

1. Distribute

OR

Combine Like Terms

OR

Clear the Denominator

2. Move the baby (smaller) to the mama (bigger)

get variables on same side

$4+2x=-5-x$

$+x \quad +x$

$4+3x=-5$

$4+3x=-5$

$-4 \quad -4$

$3x=-9$

3. Get the constants on the other side

Add/Subtract

4. Divide or multiply to isolate the variable

$4+2x=-5-x$

$+x \quad +x$

$4+3x=-5$

$-4 \quad -4$

$\frac{3x}{3}=\frac{-9}{3}$

$x=-3$

Algebra I - Unit 1: Topic 2 – Solving Multi-Step Equations with Variables on Both Sides

Practice - Solving Multi-Step Equations with Variables on Both Sides pp 100-106

Name _____ Date _____ Per _____

Solve the following problems, and then check your answer.

1. $6x + 7 = 8x - 13$

2. $2(5n - 2) = 4(n + 2)$

3. $3d - 18 = -d + 30$

4. $2(x + 4) = \frac{-3x - 7}{2} \cdot 2$

5. $-x + 3 = -\frac{4}{7}x$

6. $28 - 2.2y = 11.6y + 262.6$

7. $-8 - 3x = x - 4(2 + x)$

8. $6(y + 2) - 4 = 6y$

$6y + 12 - 4 = 6y$

$6y + 8 = 6y$

$-6y \quad -6y$

$8 = 0$

NO SOLUTION

9. $4(2a - 8) = \frac{1}{7}(49a + 70)$

$8a - 32 = 7a + 10$

$-7a \quad -7a$

$1a - 32 = 10$

$+32 \quad +32$

$a = 42$

Algebra I - Unit 1: Topic 2 – Solving Multi-Step Equations with Variables on Both Sides

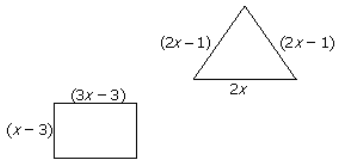
Define a variable, set up an equation, then solve. Write your answer in a complete sentence.

10. Two less than 2 times a number is 64 plus the same number. Find the number.

11. Twice the greater of two consecutive odd integers is 13 less than three times the lesser. Find the integers.

OMIT

12. Claire purchased just enough fencing (in meters) to border either a rectangular or triangular garden shown below whose perimeters are the same. What is the value of x and how much fencing did she buy?



13. A moving company charges $800 plus $16 per hour. Another moving company charges $720 plus $21 per hour. How long is a job that costs the same no matter which company they use?

A : 800+16h
B : 720+21h
16 hours

800+16h = 720+21h
−16h −16h
800 = 720+5h
−720 −720
80/5 = 5h/5
16 = h

14. The measure of an angle is 75° more than its supplement. Find the measure of each angle.

15. The complement of an angle is 15° more than twice the measure of the angle. Find the measure of the largest angle.

EXIT Ticket

ON A NOTECARD...

Ferris Bueller was not at school today. He is very worried that he will get behind so he has called you, his closest friend, to help him out with the lesson that he missed today.

First come up with an example that you can use and then write out the steps that he should go through when solving an equation with variables on both sides.