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Warm Up $10/(4 \cdot 3 \cdot 2 \cdot 1)$

Solve the equation. Check your solution.

1. $-3x - 45 = -35$

Some of you are SLACKING on your homework…

$$-2\frac{4}{5} = -3\frac{1}{2}n$$

$-3\frac{1}{2}$ $\qquad$ $-3\frac{1}{2}$

$$n = \frac{4}{5}$$

This does **NOT** show your work. This basically just tells me you used a calculator.

Some of you are SLACKING on your homework…

$$-2\frac{4}{5} = -3\frac{1}{2}n$$

$$-2\frac{4}{5} = -3\frac{1}{2}\left(\frac{4}{5}\right)$$

$$n = \frac{4}{5}$$

This one tells me:
"I looked in the back of the book, then checked my answer to make it look like I showed my work."

- Some of you do a GREAT job on your homework
- Some of you need to start doing a better job!
- The more seriously you take your homework, the better you will learn

By the way…

- You should save your homework. It is a GREAT way to study for quizzes.
- If you missed problems on the homework, you REALLY should figure out how to do them before the quiz.
- There will be an equations quiz on Friday.

p.125 (1 – 9)

p.125
1) a = 3
2) x = 5
3) c = -4
4) x = 8
5) w = 52
6) x = -2
7) n = 5; 5 bracelets
8) g = 15; 15 bracelets
9) a = 64

If you got one wrong and you can't figure out how, please request to see it worked out!!!

Analyzing some of the slope-intercept letters

- For each letter, we'll identify some things we LIKE about them, as well as ways we could improve them.
- Note: I left out the first few sentences of most of these letters.
- I also did not reproduce the diagrams if you made any.

Letter #1

- Okay, so in math class we learned how to graph an equation in slope-intercept form. For example: let's try the equation y = 3x + 4. On the graph you place a dot on the 4 on the y-axis. For the slope you would find the 4 and go up 3 and move 1 space to the right. That's how you graph an equation in slope-intercept form.

- Something you **LIKE** about this letter?
- Ways you could improve it?

Pros
- Describes specifically where to put the y-intercept

Cons
- Only describes one example, does not describe the process in general

Letter #2

- What you do first is look at the x. Whatever the number is that is the slope of the graph. For example, y = 2x + 7. But before you put any points on the graph, you need to plot the y-intercept. In this case the y-intercept is 7. y = 2x + **7**. Once you plot it remember that the numerator is always the y-axis and the denominator is always the x-axis. So go up two from seven and over one to the right.

- Something you **LIKE** about this letter?
- Ways you could improve it?

Pros
- Describes the process a little more generally
- Some good vocab (slope, y-intercept, numerator, denominator)

Cons
- Does not say where to put the y-intercept
- Does not explain why you go over one to the right
- Some incorrect vocab (x-axis, y-axis)

Letter #3

- I will show you how to graph an equation. First, look at where the plus or minus is, look after that. Place a point where that number is on the y (vertical) axis. Then look at the number before the x. Take that number and go up as many blocks as the numerator is. Then go over as many blocks as the denominator is. If there is no denominator move over 1 square. Place a point when you have moved over.

- Something you **LIKE** about this letter?
- Ways you could improve it?

Pros
- Much better job of describing the process **in general**

Cons
- Does not take negatives (up/down vs. left/right) into account
- Description will not work if the equation is mixed around
  - y = 8 + 2x

Letter #4

- When you are graphing an equation in slope-intercept form you want to put your first point on where the y-intercept is. If the equation formula is **y = mx + b** your first point should be the **b**. Then after that you should go up on the y-axis **m** amount of times and over either one, or if is a fraction go over the denominator amount of times. So if the equation is y = 3x + 2 your first point would be 2 on the y-axis then go up 3, then over 1 to the right for your second point. If it was y = -3x + 2 you would go down 3 instead of up 3.

- Something you **LIKE** about this letter?
- Ways you could improve it?

Pros
- Describes the difference between positive and negative slope
- Talks about a general process and not just specific examples

Cons
- "Over" which way? Left or right?
- "Your first point should be the **b**"…but where does it go?

Letter #5

- I'm gonna teach you slope-intercept. In order to graph you need an equation so let's use $y = 3x + 5$. y is 5 so mark 5 on your y axis and go up three over to the right one. Let's use $y = -3x + 5$ you mark y at positive 5 go down 3 and over to the right one. Let's use $y = \frac{1}{3}x + 5$ you mark y at positive 5 then go up one and over to the right 3. If you have a negative fraction for x then that negative only applies to the numerator. $y = -\frac{1}{3}x + 5$ mark y at positive 5 and go down one and over to the right 3. If y is a negative number you simply mark y at that negative number. That's all so see you soon!

- Something you **LIKE** about this letter?
- Ways you could improve it?

Pros
- Lots of examples – covers many different cases!

Cons
- No vocab
- Doesn't explain the overall rules in general

Letter #6

- What you first need to do is figure out the y-intercept in the equation, which will be the number without the variable. You will then graph the point, which will be located on the y-axis. If the number has a negative sign, the number will go below the x-axis, and if the number is positive, it will go above the x-axis. After you have graphed the y-intercept, you will need to figure out the slope, which will be the number with the variable. To graph the slope, you will begin at the y-intercept number. If the slope is positive, you can either go up and to the right, or down and to the left, and if the slope is negative, you can either go down and to the right, or up and to the left. To figure out how many spaces you go up, down, left, and right, you turn it into a fraction, or keep it as a fraction. The numerator will be how much you go up or down, and the denominator will be how much you go left or right. I hope this helped.

- Something you **LIKE** about this letter?
- Ways you could improve it?

Some things that most of you forgot…

- "Once you have graphed the slope it should create a line of dots. Connect these lines and you are done!"
- "Then you go up 2 over 1 because the graph is increasing by 2. **Then you keep doing that.** Finally, you have all your dots so you put the line through.
  P.S. Don't forget the arrows."

These details at the end are important too!!!

BACK TO YOUR NOTES FROM FRIDAY!

Analyzing Equations – solving them mentally

$$3x + 10 = 55$$

If 3x + 10 is 55, what is the 3x part?

Analyzing Equations – solving them mentally

$$2x - 8 = -2$$

If 2x – 8 is -2, what is the 2x part?

Analyzing Equations – solving them mentally

$$\frac{x + 5}{2} = 7$$

What does the x + 5 part have to equal?

Analyzing Equations – solving them mentally

$$55 - 2x = 47$$

What does the 2x part have to equal?

Analyzing Equations – solving them mentally

$$\frac{1}{4}x - 18 = 2$$

What does the $\frac{1}{4}x$ part have to equal?

Analyzing Equations – solving them mentally

$$\frac{3x}{4} = 6$$

What does the 3x part have to equal?

Analyzing Equations – solving them mentally

$$2 \cdot (x - 3) = 42$$

What does the (x – 3) part have to equal?

Analyzing Equations – solving them mentally

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

What does the (x +1) part have to equal?

How do the equation-solving steps relate to this?

$$3x + 10 = 55$$
$$-10 \quad -10$$
$$\frac{3x}{3} = \frac{45}{3}$$
$$\boxed{x = 15}$$

How do the equation-solving steps relate to this?

$$\frac{x+5}{2} = 7$$

$$\cdot 2 \quad \cdot 2$$

$$x + 5 = 14$$

$$-5 \quad -5$$

$$x = 9$$

How do the equation-solving steps relate to this?

$$\frac{1}{4}x - 18 = 2$$

$$+18 \quad +18$$

$$4 \cdot \frac{1}{4}x = 20 \cdot 4$$

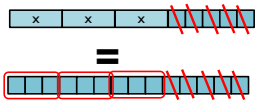
$$x = 80$$

Showing work???

- I don't mind if you solve an equation a different way **AS LONG AS** you show the work for the process you used.
- **HOWEVER…**if you do not master the traditional equation-solving process, more difficult equations will be MUCH harder for you

Showing with diagrams…

- $3x + 5 = 14$

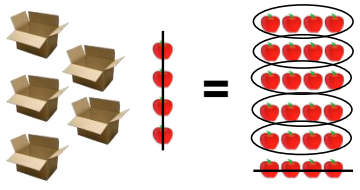


Draw a BAR diagram to represent this equation…

- $17 = 2x + 9$

Boxes and Apples…

$$5x + 4 = 24$$



More examples

SOLVE. Check each answer.

4. $18 - 5x = 30$ **x = $-\frac{12}{5}$ or -2.4**

5. $\frac{x-10}{3} = 4$ **x = 22**

6. $-19 = 4x - 19$ **x = 0**

$$\frac{2}{3}x = 6$$

EQUATIONS WITH FRACTIONS: RULES

- To solve an equation, you are trying to get **1x.**
- When you have a coefficient that is a fraction, you can "get rid" of it by multiplying by the reciprocal.
  - **THIS IS BECAUSE ANY FRACTION TIMES ITS RECIPROCAL IS 1!!!**
- If you have mixed numbers, you should change them into improper fractions to make them easier to deal with.
- **You should get the term with a fraction by itself before you multiply by the reciprocal!**

Solve on a notecard:

1. $-18 + 3a = 15$
2. $30 = \frac{3}{2}b + 12$
3. $-5x + 40 = 5$