Math 7 ACC Unit 3 Study Guide 2017-18 Name: Key Date: Per:

**Show ALL work!**

2pts 1. Solve for $x$ *by busting the fractions*: $\frac{2}{5}x + \frac{1}{3} = 1$. (15) (15) (15)

LCM: 15

show work!

$6x + 5 = 15$

$-5 \quad -5$

$6x = 10$

$\frac{6x}{6} = \frac{10}{6}$

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

2. *"I HATE solving equations with decimals!"* Beverly whined to her friends. *"It is just such a pain! I seem to always make mistakes or lose my decimal point,"* she finished. *"Do you have an example?"* asked her friend Dorothy. *"I do. Look at this problem,"* Beverly said.

Solve for $x$:

$.52x - .32 = 1.23$

(a) $52x - 32 = 123$

$+32 \quad +32$

$\frac{52x}{52} = \frac{155}{52}$

$x \approx 2.98$

(b) $0.52x - 0.32 = 1.23$

$+0.32 \quad +0.32$

$\frac{0.52x}{0.52} = \frac{1.55}{0.52}$

$x \approx 2.98$

*"Oh, don't let that kind of problem get you frustrated,"* Dorothy told Beverly. *"Just multiply everything by 100 first!"* she added gleefully. *"What?"* Beverly asked. *"How can I do that?"*

2pts a. Try Dorothy's suggestion: multiply each term by 100. Can you solve the equation easier then?

show work!

2pts b. Solve the original equation. Did you get the same answer as in part (a)?

show work! Yes, you get the same answer.

3. Eugene solved the system of equations below. His solution was (3, −4). Without solving the system yourself, can you tell him whether the solution is correct? Prove whether or not the system is correct and explain your reasoning. show work!

2pts.

(x, y)

$3 + (-4) = -1$ ✓ $x + y = -1$

✓ $\frac{1}{3}x + \frac{1}{4}y = 0$

$\frac{1}{3}(3) + \frac{1}{4}(-4) = 0$

$1 + (-1) = 0$

Yes, it works for both equations.

4. Paco and his friend, Fabienne, like to collect baseball cards. Paco has 5 cards and collects 2 more each week. Fabienne has 9 cards and collects 1 more each week. These relationships are shown as rules (equations) below. For the rules, $x$ represents the number of weeks and $y$ represents the number of cards. *two different methods

3pts.

Paco's Rule: $y = 5 + 2x$ Fabienne's Rule: $y = 9 + 1x$

$5 + 2x = 9 + 1x$

$-1x \quad -1x$

$5 + x = 9$

$-5 \quad -5$

$x = 4$

substitution

$y = 5 + 2(4)$

$y = 13$

a. In how many weeks will Paco and Fabienne have the same number of baseball cards?

4 weeks

b. How many cards will each person have at this time?

13 cards

c. Choose a second method (table, graph or equal values) to verify that your answers above are correct.

4c. Table

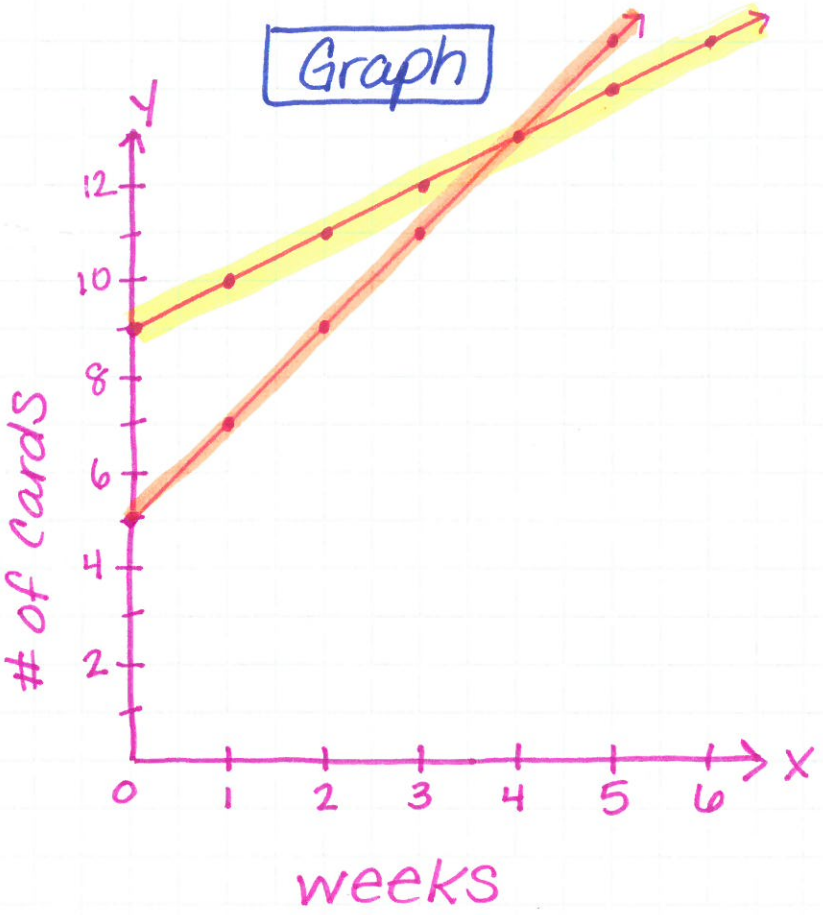
Paco

| x | y | |
|---|---|---|
| 0 | 5 | |
| | | +2 |
| 1 | 7 | |
| | | +2 |
| 2 | 9 | |
| | | +2 |
| 3 | 11 | |
| | | +2 |
| 4 | 13 | |
| | | +2 |
| 5 | 15 | |

Fabienne

| x | y | |
|---|---|---|
| 0 | 9 | |
| | | +1 |
| 1 | 10 | |
| | | +1 |
| 2 | 11 | |
| | | +1 |
| 3 | 12 | |
| | | +1 |
| 4 | 13 | |
| | | +1 |
| 5 | 14 | |

Graph




$y = 5 + 2x$ $y = 9 + 1x$

Equal Values Method (Substitution)

$y = 5 + 2x$ $y = 9 + 1x$

$5 + 2x = 9 + 1x$

$-1x \quad -1x$

$5 + x = 9$

$-5 \quad -5$

$x = 4$

$y = 5 + 2x$

$y = 5 + 2(4)$

$y = 5 + 8$

$y = 13$

$y = 9 + 1x$

$y = 9 + 1(4)$

$y = 9 + 4$

$y = 13$

7pts

5. Use tables, rules, and a graph to find and check the solution for the following problem.

Show work!

Edda has a poodle that weighs 7 pounds and gains 1 pound per year. Walden has a young sheltie that weighs 2 pounds and gains 1 pound every 6 months. When will the two dogs weigh the same amount?

In 5 years they will weigh 12 pounds.

↳ 2 lbs/year

Tables

Edda's poodle

| x | y | |
|---|---|---|
| 0 | 7 | |
| 1 | 8 | +1 |
| 2 | 9 | +1 |
| 3 | 10 | +1 |
| 4 | 11 | +1 |
| 5 | 12 | +1 |

Walden's sheltie

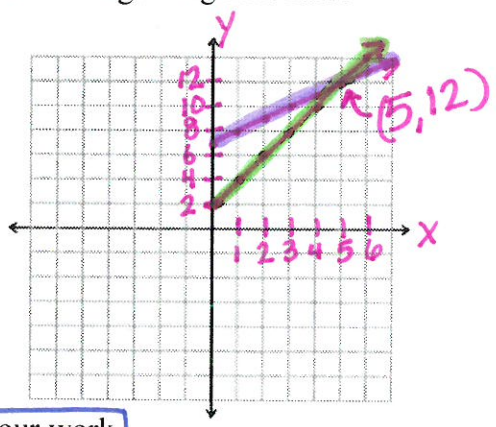
| x | y | |
|---|---|---|
| 0 | 2 | |
| 1 | 4 | +2 |
| 2 | 6 | +2 |
| 3 | 8 | +2 |
| 4 | 10 | +2 |
| 5 | 12 | +2 |

Rules

$y = x + 7$

$y = 1x + 7$

$y = 2x + 2$




or

2pts

Show work!

6. Solve the following equation for the indicated variable. Show all of your work.

Solve for $x$: $y = 4x + 3$

$-3 \quad -3$

$\frac{y-3}{4} = \frac{4x}{4}$

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

3pts

Show work!

7. Solve the equation below for $y$. State the growth and the $y$-intercept.

$-6x + 5y = -3(2 - y)$

$-6x + 5y = -6 + 3y$

$-3y \quad -3y$

$-6x + 2y = -6$

$+6x \quad +6x$

$2y = 6x - 6$

$\frac{2y}{2} = \frac{6x}{2} - \frac{6}{2}$

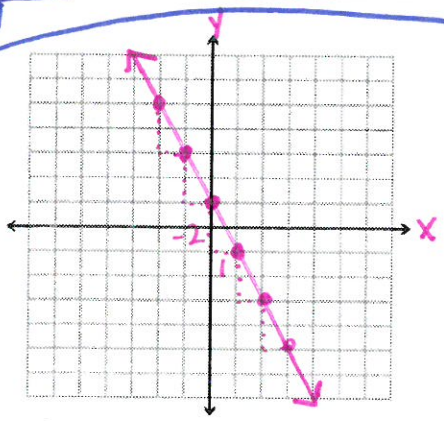
$y = 3x - 3$

growth ($m$) = 3

$y$-intercept ($b$) = −3

2pts

8. Graph $y = -2x + 1$ without using a table. Explain the steps you took to graph it.




① Plot the y-intercept

② write the slope (m) as $\frac{\text{rise}}{\text{run}} = \frac{-2}{1}$ *draw growth triangle and repeat

③ connect plotted points.

3pts

Show work!

9. Solve the following system of equations using the Equal Values Method. Show your work and check your answer.

$2x - 2y = 6$

$y = 11 - 3x$

$2x - 2(11 - 3x) = 6$

$2x - 22 + 6x = 6$

$8x - 22 = 6$

$+22 \quad +22$

$\frac{8x}{8} = \frac{28}{8}$

$x = 3.5$

$2(3.5) - 2y = 6$

$7 - 2y = 6$

$-7 \quad -7$

$-2y = -1$

$\frac{-2y}{-2} = \frac{-1}{-2}$

$y = \frac{1}{2}$ or 0.5

$y = 11 - 3(3.5)$

$y = 11 - 10.5$

$y = 0.5$

Answer: (3.5, 0.5)

(x, y)