

Tuesday, September 4th, 2018

Solve each inequality and graph its solution.

1) $-5(3x-8) \leq 130$
 $x \geq -6$
closed circle
greater than or equal to
right

2) $-7(1-7a) \leq 140$
 $-7 + 49a \leq 140$
 $+7$
 $49a \leq 147$
 $a \leq 3$

3) $-2x - 5 \geq -7(8x - 7)$

4) $-8(b+1) + 3 \leq -33 - 4b$
 $-8b - 8 + 3 \leq -33 - 4b$
 $-8b - 5 \leq -33 - 4b$
 $+4b$
 $-4b - 5 \leq -33$
 $+5$
 $-4b \leq -28$
 -4
 $b \geq 7$

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Solve each inequality and graph its solution.

1) $-5(3x-8) \leq 130$

$-15x + 40 \leq 130$
 -40
 $-15x \leq 90$
 -15
 $x \geq -6$

When you:
 or * by a
 negative
 reverse
 the inequality
 sign!

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Foundations of Algebra Unit 2 - Relationships Among Quantities

Name: _____ Date: _____

Day 3 - Literal Equations

area = rectangle
 $1. a = \frac{bh}{2}$ (b)
 $\frac{a}{h} = b$

Eqn of a line
 $2. y = mx + b$ (b)
 $y - mx = b$

3. $2x + 4y = 10$ (x)
 $-4y - 4y$
 $8x = 10 - 4y$
 $x = \frac{10 - 4y}{8}$

4. $y = mx + b$ (m)
 $-b - b$
 $y - b = mx$
 $\frac{y - b}{x} = m$

5. $p - 2l = \frac{8w}{2}$ (w) per: meter of rectangle
 $\frac{p - 2l}{2} = w$

6. $\frac{a}{2} = (b+1)2$ (a)
 $a = 2b + 2$

7. $-5x = -5b - 4$ (x)
 $x = \frac{-5b - 4}{-5}$

8. $b - 4x = 7a$
 $+4x + 4x$
 $b = 7a + 4x$

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9. $6x - 3y = 15$ (y)

10. $y = \frac{1}{2}8b$ (b)

11. $P = \frac{8w}{2}$ (w)

12. $3x + 5 = y + 5z$ (z)

13. $A = \frac{5x+3}{2}$ (A)

14. $xy + w = 9$ (w)

15. $\frac{2x}{3} = r$ (r)

16. $6x + 4f = 9w$ (w)

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Foundations of Algebra Unit 2 - Relationships Among Quantities

Name: _____ Date: _____

Day 3 - Literal Equations

Solve the equation for the indicated variable.

1. $ax + by = c$ (y)
 $by = -ax + c$
 $y = \frac{-ax + c}{b}$

2. $6x - 3y = 15$ (y)
 $Y = 15 - 5x$

3. $15x + 15x = 25$ (x)
 $30x = 25$
 $x = \frac{25}{30} = \frac{5}{6}$

4. $4 - 3x + 7 = 6$ (x)
 $-3x + 11 = 6$
 $-3x = -5$
 $x = \frac{5}{3}$

5. $6 - 6x + 12y = -24$ (y)
 $12y = -24 + 6x$
 $y = \frac{-24 + 6x}{12}$

6. $p - 2l = \frac{8w}{2}$ (w)
 $\frac{p - 2l}{2} = w$

7. $h = \frac{s}{2\pi r}$

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9. $E = mc^2$ (m)

10. $-20x - 5y = 30$ (y)

11. $A = \frac{8w}{2}$ (w)

12. $y = mx + b$ (x)

13. $V = \frac{1}{2}8b$ (b)

14. $A = \frac{5x+3}{2}$ (c)

15. $m = \frac{2x}{3}$ (E)

16. $6x + 12y = -18$ (x)

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Wednesday, September 5th, 2018

Solve for the indicated variable in the parenthesis.
 Pressure = I R Time

1) $P = IRT$ (I)

2) $A = 2(L+W)$ (W)
 $A = 2L + 2W$
 $A - 2L = 2W$
 $\frac{A - 2L}{2} = \frac{2W}{2}$

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

$$\begin{array}{r} y = 5x - 6 \\ -6 \\ \hline y + 6 = 5x \\ \frac{y + 6}{5} = \frac{5x}{5} \\ \frac{y + 6}{5} = x \end{array}$$

4) $2x - 3y = 8$ (y)

$$\begin{array}{r} 2x - 3y = 8 \\ -2x \\ \hline -3y = 8 - 2x \\ \frac{-3y}{-3} = \frac{8 - 2x}{-3} \\ y = \frac{8 - 2x}{-3} \end{array}$$

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2) $A = 2(L+W)$ (W)

$$\begin{array}{r} A = 2L + 2W \\ -2L - 2L \\ \hline A - 2L = 2W \\ \frac{A - 2L}{2} = \frac{2W}{2} \end{array}$$

equal

$$\frac{A}{2} = L + W$$

$$\frac{A}{2} - L = W$$

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Foundations of Algebra Unit 2: Relationships Among Quantities Practice

Name: _____ Date: _____

Day 4 - Literal Equations Additional Practice

Directions: Rewrite each equation in terms of the indicated variable.

1. $d = rt$ Solve for t .

2. $\frac{1}{2}x + 3 = 7$ Solve for x .

3. $ax + by = c$ Solve for b .

4. $\frac{x+y}{3} = 5$ Solve for x .

5. $A = 2(L+W)$ Solve for W .

6. $12x - 4y = 20$ Solve for y .

7. $x = \frac{yz}{5}$ Solve for x .

8. $x - 2y = z$ Solve for x .

9. $2x - 3y = 8$ Solve for y .

10. $7x - y = 14$ Solve for y .

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Thursday, September 6th, 2018

5) $\frac{x+y}{3} = 5$ (x)

6) $y = mx + b$ (b)

7) $ax + by = c$ (y)

8) $A = 1/2h(b+c)$ (b)

9) $V = LWH$ (L)

10) $A = 4\pi r^2$ (r)

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Foundations of Algebra Unit 2: Relationships Among Quantities Notes

Name: _____ Date: _____

Day 5 - Writing and Solving Linear Equations

Practice Examples: In the examples below, "talk through the text" as you translate your word problems into equations. Define a variable to represent an unknown quantity, create your equation, and then solve your equation.

1. Six less than four times a number is 18. What is the number?

2. You and three friends divide the proceeds of a garage sale equally. The garage sale earned \$412. How much money did each friend receive?

3. Brianna has saved \$60 to buy a new TV. If the TV she wants costs \$180 and she saves \$20 a week, how many weeks will it take her to buy the TV?

4. A rectangle is 5 yards longer than it is wide. Its perimeter is 98 yards. Find its length and width.

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Foundations of Algebra Unit 2: Relationships Among Quantities Notes

Consecutive Number Problems

| Type of Consecutive Numbers | Examples | Expressions for Terms |
|-----------------------------|--------------------------|-------------------------|
| Consecutive Numbers | 4, 5, 6 27, 28, 29 | x , $x + 1$, $x + 2$ |
| Consecutive Even Numbers | 8, 10, 12 62, 64, 66 | x , $x + 2$, $x + 4$ |
| Consecutive Odd Numbers | 23, 25, 27 89, 91, 93 | x , $x + 2$, $x + 4$ |

5. The sum of 3 consecutive even numbers is 102. Find the three numbers.

6. The sum of 4 consecutive numbers add up to 4810. Find the four numbers.

7. Find three consecutive odd integers whose sum is 261.

8. The sum of three consecutive numbers is 72. What is the product of these numbers?

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Foundations of Algebra Unit 2 - Relationships Among Quantities Practice
 Name: _____ Date: _____

Day 5 - Writing and Solving Linear Equations Practice

Solve each problem below by using a five step plan.

- Drawing a Sketch (if necessary)
- Defining a Variable
- Setting up an equation
- Solve the equation
- Make sure you answer the question

- The sum of 38 and twice a number is 124. Find the number.

- Twelve subtracted from three times a number is 15. Find the number.

- Seven more than three times number is forty-three. Find the number.

- Find two consecutive integers whose sum is 83.

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Foundations of Algebra Unit 2 - Relationships Among Quantities Practice
 Name: _____ Date: _____

- Find three consecutive even integers whose sum is 228.

- Find three consecutive odd integers whose sum is 261.

- A rectangle is 12m longer than it is wide. Its perimeter is 68m. Find its length and width.

- The length of a rectangle is 4 cm more than the width and the perimeter is 52 cm. Find the length and width of the rectangle.

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Friday, September 7th, 2018

- Find two consecutive integers whose sum is 123
- Find three consecutive even integers whose sum is 84
- Find two consecutive odd integers whose sum is 128

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Foundations of Algebra Unit 2 - Relationships Among Quantities Practice
 Name: _____ Date: _____

Day 6 - Writing and Solving Linear Inequalities

When creating problems that involve inequalities, you will use the same methods as creating equations, except you have new keywords that will replace the equal sign with an inequality sign.

| < | ≤ | > | ≥ |
|------------|-----------------------|--------------|--------------------------|
| Less than | Less than or equal to | Greater than | Greater than or equal to |
| Fewer than | At most | More than | At least |
| | Maximum | | Minimum |
| | No more than | | No less than |

Practice Examples: Define a variable for the unknown quantity, create an inequality, and then solve.

- One half of a number decreased by 3 is no more than 33.

- Six times the sum of a number and eight is less than ninety-eight. Find the largest number that makes this statement true.

- Find the two largest consecutive even integers whose sum is no more than 226.

- Alex is saving to buy a laptop that costs \$1120. So far she has saved \$400. She makes \$12 an hour babysitting. What's the least number of hours she needs to work in order to reach her goal?

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Foundations of Algebra Unit 2 - Relationships Among Quantities Practice
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- Kathy has \$500 in a savings account at the bank at the beginning of the summer. He wants to have at least \$200 in the account by the end of the summer. He withdraws \$25 each week for food, clothes, and movie tickets. How many weeks can Kathy withdraw money from his account?

- There are three exams in a marking period. A student received grades of 75 and 81 on the first two exams. What grade must the student earn on the last exam to get an average of at least an 80 for the marking period?

- Your manager tells you that you must maintain an average of 30 hours per week during the "holiday season" months. If you worked 27 hours week one, 33 hours week two, and 29 hours week 3, how many hours can you work the last week of the month to average at least 30 hours per week?

- The width of a rectangle is 5 feet less than the length. The perimeter is greater than 62. Find the minimum length and width of the rectangle.

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Foundations of Algebra Unit 2 - Relationships Among Quantities Practice
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Day 6 - Solving Linear Equations and Inequalities

- The sum of 14 and twice a number is no more than 70. What is the largest value the number could be?

- A number subtracted from 68 is at least 54. What is the biggest solution?

- The sum of two consecutive integers is 161. Find the consecutive integers.

- Find three consecutive integers whose sum is less than 72. Find the largest solutions possible.

- The sum of three consecutive even integers is 54. Find the three consecutive even numbers.

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Foundations of Algebra Unit 2 – Relationships Among Quantities Practice

6. The length of a rectangle is triple the width, its perimeter is more than 40m. Find the smallest possible values for its length and width.

7. The width of a rectangle is 6 inches less than the length. If the perimeter is 84 inches, what is the length and width?

8. Your first four biology test grades were 64, 76, 82 and 68. In order to pass the class with an average of a 70, what must your fifth test score be?

9. You are only allowed to work on an average of 20 hours per week during school each month. If you worked 16 hours week one, 25 hours week two, and 17 hours week 3, how many hours can you work the last week to average at least 20 hours per week?

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