SECONDARY MATH I // MODULE 4
SOLVING EQUATIONS AND INEQUALITIES – 4.1

4.1

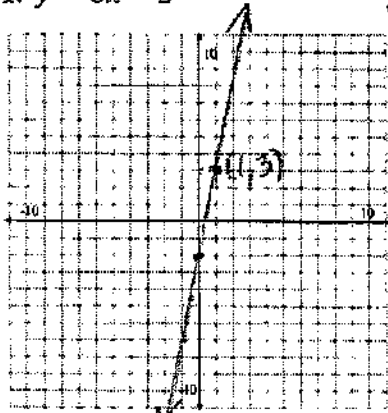READY, SET, GO!   **Name**   **Period**   **Date**

READY

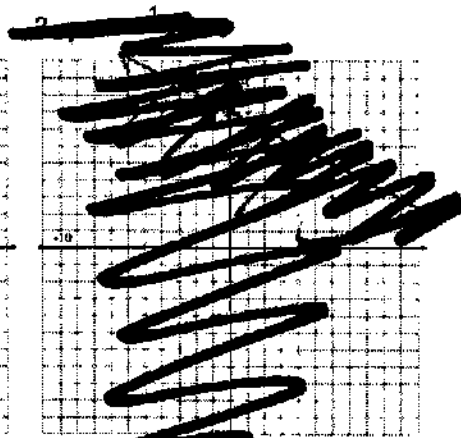Topic: Solutions to an equation.

Graph the following equations on the coordinate grid. Determine if the given point is a solution to the equation?
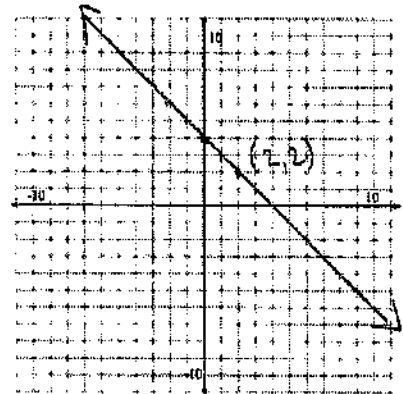
1. $y = 5x - 2$

Point: $(1, 3)$ Yes? / No?

$3 = 5(1) - 2$ ✓

2.

Po

3. $y = -x + 4$

Point: $(2, 2)$ Yes? / No?

$2 = -2 + 4$ ✓

4. $y = x + 2$
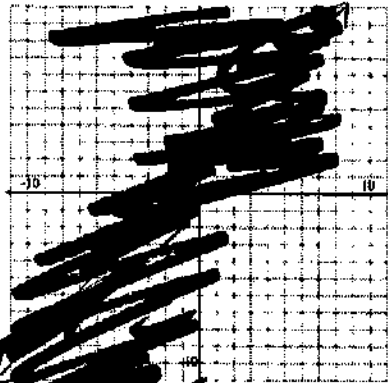
5. $y = \frac{5}{2}x - 7$

Point: $(2, -2)$ Yes? / No?

$-2 = \frac{5}{2}(2) - 7$

$-2 = 5 - 7$ ✓

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

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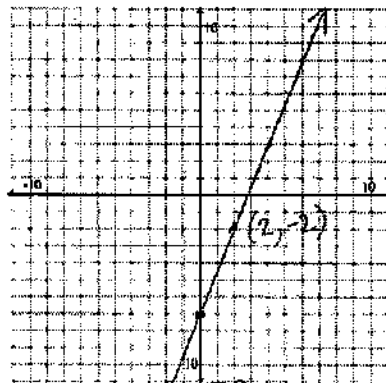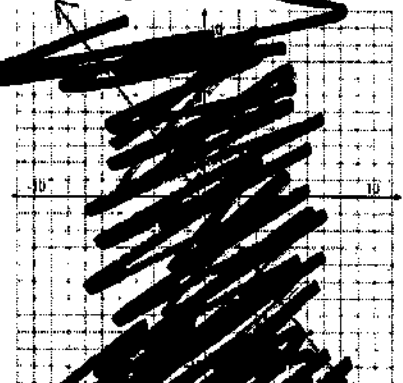
SET

Topic: Solve linear equations using parentheses.

Determine if the two expressions listed are equivalent. **Explain your reasoning.**

7. $14 - (3a + 2)$ $14 - 1(3a) - 1(2)$ $14 - 3a - 2$	$14 - 3a - 2$ $Yes -$ Distributive Property	8. $4b - 10$ ▓▓▓	$2(2b - 5)$ ▓▓▓
9. $\frac{(x-7)}{4}$	$\frac{x}{4} - \frac{7}{4}$ Common Denominator $\frac{x-7}{4}$ Add numerators over common denominator	10. $\frac{3(w-9)}{5}$ ▓▓▓	$\frac{3w}{5} - 27$ ▓▓▓

11. Without solving, determine if the two equations below have the same solution. Explain why or why not?

$$3(x - 5) = 35 \text{ and } 3x - 5 = 35.$$

No, the first equation is actually $3x - 15 = 35$. $3x - 15 \neq 3x - 5$

12. Circle the expressions that are equivalent.

▓▓▓▓▓▓▓▓

Solve for x.

13. $\frac{4(x-2)}{5} = 20 \cdot 5$

$4x - 8 = 100$

$4x = 108$

$\boxed{x = 27}$

14. $4\left(\frac{x}{5} - 2\right) = 20$

▓▓▓

15. $5 \cdot \frac{4x-2}{5} = 20 \cdot 5$

$4x - 2 = 100$

$4x = 102$

$\boxed{x = 25.5}$

GO

Topic: Determine if a number is a solution to an equation.

Indicate whether the given value is a solution to the corresponding equation.

Show your work.

16. $a = -3$; ▪$4a + 3 = -9$

▓▓▓

17. $x = \frac{4}{3}$;

(Yes)/No?

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

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

$1 + \frac{1}{2} = \frac{3}{2}$ ✓

18. $y = 2$; $2.5y - 10 = -0.5$

▓▓▓

19. $z = -5$;

Yes?/(No?)

$2(5 - 2z) = 20 - 2(z - 1)$

$2(5 - 2(-5)) = 20 - 2(-5-1)$

$2(5 + 10) = 20 - 2(-6)$

$2(15) = 20 + 12$

$30 \neq 32$

20. $w = \frac{1}{4}$; $4w = w + \frac{3}{4}$

▓▓▓

21. $b = 5$;

(Yes)/No?

$6x - 2 = 4(x + 2)$

$6(5) - 2 = 4(5+2)$

$30 - 2 = 4(7)$

$28 = 28$ ✓

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SECONDARY MATH I // MODULE 4
SOLVING EQUATIONS AND INEQUALITIES – 4.2

4.2

| READY, SET, GO! | Name | Period | Date |

READY

Topic: Isolate a variable with inverse operations.

Isolate the indicated variable and then fill in the blank for the statement that follows.

1. Solve for x; $ax = 7$ — I can find $1x$ or x by __dividing by a__ on both sides of the equation.

2. Solve for p; $8 + p = w$ — I can find $1p$ or p by ~~▮▮▮▮▮~~ on both sides of the equation.

3. Solve for m; $e = mc^2$ — I can find $1m$ or m by __dividing by c^2__ on both sides of the equation.

4. Solve for t; $d = rt$ — I can find $1t$ or t by ~~▮▮▮▮▮~~ on both sides of the equation.

5. Solve for r; $d = rt$ — I can find r by __dividing by t__ on both sides of the equation.

6. Solve for h; $7 - h = 0$ — I can find h by ~~▮▮▮▮~~ on both sides of the equation.

7. Solve for b; $b - 11 = 3$ — I can find b by __adding 11__ on both sides of the equation.

8. Solve for y; $\frac{1}{2}y = k$ — I can find y by ~~▮▮▮▮▮~~ on both sides of the equation.

9. Solve for h; $A = \frac{bh}{2}$ — I can find h by __multiplying by $\frac{2}{b}$__ on both sides of the equation.

10. Solve for x; $y = mx + b$ — I can find x by ~~▮▮▮▮▮~~ on both sides of the equation.

SET

$y - b = mx$

Topic: Defining and interpreting variables and units of measure.

Jaxon likes to be organized, so he made the following chart. He has decided to keep track of the miles he runs and the time he spends running. He attends P.E. class on Monday, Wednesday, and Friday, but he goes to school everyday. *Fill in the Units column on the chart.*

Symbol	Meaning (Description of what the symbol means in context)	Units (What is counted or measured)
M	Number of miles ran in PE class on Mondays	miles
W	Number of miles ran PE class on Wednesdays	miles
F	Number of miles ran PE class on Fridays	miles
S	Number of miles from Jaxon's house to the school.	miles
H	Time (in hours) to travel to school	hours
t_M	Time (in minutes) spent running in PE on Monday	minutes
t_W	Time (in minutes) spent running in PE on Wednesday	minutes
t_F	Time (in minutes) spent running in PE on Friday	minutes

Make meaning of the expressions below, write what they each mean! If an expression does not make sense, say why.

[miles/week]

11. $M + W + F$
miles ran in a week

12. $4(M + W + F)$ ~~▮▮▮▮▮~~

13. $2S$ # miles to school & back

14. $t_M + t_W + t_F$ ~~▮▮▮▮~~

15. $\frac{t_M + t_W + t_F}{3}$
average time ran per day

16. $5(2H)$ ~~▮▮▮▮▮~~

17. $M + H$ [miles/day]
Monday [Hours to school + back]
Miles + school + back
Doesn't make sense, They are not the same units.

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[minutes per day]

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GO

Topic: Set notation to interval notation. Inequalities on a number line.

Below you will find the domains of several different functions. The domains are described in either set notation or interval notation. Fill in the missing notation.

Set Notation	Interval Notation
18. $\{x \mid x \in \mathbb{R}, -2 < x < 6\}$	▓▓▓▓▓
19. $\{x \mid x \in \mathbb{R}, -4 \le x \le 7\}$	$[-4, 7]$
20. $\{x \mid x \in \mathbb{R}, x \ge -9\}$	▓▓▓▓▓
21. $\{x \mid x \in \mathbb{R}, 0 < x \le 13\}$	$(0, 13]$
22. $\{x \mid x \in \mathbb{R}, -15 \le x \le -8\}$	▓▓▓▓▓
23. $\{x \mid x \in \mathbb{R}, -32 \le x < -15\}$	$[-32, -15)$
24. ▓▓▓▓▓	$(-\infty, \infty)$

25. Which notation, interval or set, would most appropriate when working with a domain of whole numbers?

For each of the inequalities provided graph the values being described on the numbers line.

26.	$x < 6$	▓▓▓▓▓▓▓▓▓▓
27.	$x > 5$	
28.	$x \ge -9$	▓▓▓▓▓▓▓▓▓▓
29.	$-7 \le x < 0$	
30.	$3 \le x \le 25$	▓▓▓▓▓▓▓▓▓▓
31.	$-15 < x \le 8$	

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SECONDARY MATH I // MODULE 4

SOLVING EQUATIONS AND INEQUALITIES – 4.3

4.3

> ## READY, SET, GO!

Name   Period   Date

READY

Topic: Solving Inequalities.

Use the inequality $-9 < 2$ to complete each row in the table.

Apply each operation to the original inequality $-9 < 2$	Result	Is the resulting inequality true or false?
Example: Add 3 to both sides	$-9+3 < 2+3 \rightarrow -6 < 5$	True
1. Subtract 7 from both sides.	$-9-7 < 2-7 \rightarrow -16 < -5$	True
2. Add 15 to both sides.	▓▓▓▓▓▓	True
3. Add -10 to both sides.	$-9+(-10) < 2+(-10) \rightarrow -19 < -8$	True
4. Multiply both sides by 10.	▓▓▓▓▓▓	True
5. Divide both sides by 5.	$-\frac{9}{5} < \frac{2}{5}$	True
6. Multiply both sides by -6. ∫ Reverse	▓▓▓▓▓▓	False
7. Divide both sides by -3. ∫ symbol	$-\frac{9}{-3} < \frac{2}{-3} \rightarrow 3 < -\frac{2}{3}$	False

8. What operations when performed on an inequality, reverse the inequality?

(Be very specific!) The symbol is reversed when you multiply or divide both sides by a negative number.

SET

Topic: Solve literal equations that require more than one step.

Solve for the indicated variable. Show your work!!!

9. Solve for h. $\dfrac{Q}{25\pi} = \dfrac{25\pi h}{25\pi}$ $h = \dfrac{Q}{25\pi}$

10. Solve for h. $Q = \pi r^2 h$ ▓▓▓▓▓▓

11. Solve for m. $\begin{aligned} y &= 7m + 6 \\ -6 &\quad -6 \\ y-6 &= 7m \end{aligned}$ $m = \dfrac{y-6}{7}$

12. Solve for m. $y = mx + b$ ▓▓▓▓▓▓

13. Solve for z. $\begin{aligned} \dfrac{A}{3} &= \dfrac{(z+7)3}{3} \\ -7 &\quad -7 \end{aligned}$ $z = \dfrac{A}{3} - 7$

14. Solve for z. $A = (z+7)w$ ▓▓▓▓▓▓

15. Solve for x. $7 \cdot \dfrac{x+2}{7} = 4 \cdot 7$ $\begin{aligned} x+2 &= 28 \\ -2 &\quad -2 \end{aligned}$ $x = 26$

16. Solve for x. $7 \cdot \dfrac{x+2y}{7} = 4 \cdot 7$ ▓▓▓▓▓▓

17. Solve for x. $\dfrac{2x}{5} - 9 = 6$ $\dfrac{5}{2} \cdot \dfrac{2x}{5} = 15 \cdot \dfrac{5}{2}$ $x = \dfrac{75}{2}$

18. Solve for x. $\dfrac{2x}{5} - 9y = 6$ ▓▓▓▓▓▓

19. Solve for x $\dfrac{3}{4}(x - 2) = 12 \cdot \dfrac{4}{3}$ $\begin{aligned} x - 2 &= 16 \\ +2 &\quad +2 \end{aligned}$ $x = 18$

20. Solve for x. $\dfrac{3}{4}(x - 2y) = 12$ ▓▓▓▓▓▓

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GO

Topic: Identifying x-intercepts and y-intercepts
Locate the x-intercept and y-intercept in the table. Write each as an ordered pair.

21.

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

x – intercept: $(2, 0)$
y – intercept: $(0, 4)$

22.

x	y
0	-6
3	-5
6	-4
9	-3
12	-2
15	-1
18	0

x – intercept:
y – intercept:

23.

x	y
-3	10
-2	8
-1	6
0	4
1	2
2	0
3	-2

x – intercept: $(2, 0)$
y – intercept: $(0, 4)$

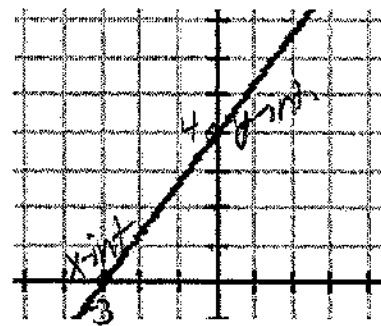**Locate the x-intercept and the y-intercept in the graph. Write each as an ordered pair.**

24.

x – intercept:
y – intercept:

25.

x – intercept: $(-3, 0)$
y – intercept: $(0, 4)$

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Solve each equation for x. Provide the justifications for each step. See the first example as a reminder for the types of justifications that might be used.

Example:

$3x - 6 = 15$	Justification
$+6 \quad +6$	Addition Property of equality
$\dfrac{3x}{3} = \dfrac{21}{3}$	Division Property of equality
$x = 7$	

26.

$4x - 10 = 2$	Justification
▨▨	▨▨

27.

$-16 = 3x + 11$	Justification
$-11 \qquad -11$	Subtraction Prop of Eq.
$\dfrac{-27}{3} = \dfrac{3x}{3}$	Division Prop of Eq.
$X = -9$	

28.

$6 - 2x = 10$	Justification
▨▨	▨▨

29.

$6x + 3 = x + 18$	Justification
$-x \qquad -x$	Subtraction Prop of Eq.
$5x + 3 = 18$	Subtraction Prop of Eq.
$-3 \qquad -3$	
$\dfrac{5x}{5} = \dfrac{15}{5}$	Division Prop of Eq.
$X = 3$	

30.

$3x - 10 = 2x + 12$	Justification
▨▨	▨▨

31.

$12x + 3y = 15$	Justification
$-3y \qquad -3y$	Subtraction Prop of Eq.
$\dfrac{12x}{12} = \dfrac{-3y}{12} + \dfrac{15}{12}$	Division Prop of Eq.
$X = -\dfrac{1}{4}y + \dfrac{15}{12}$	

32.

$X(B + 7) = 9$	Justification
▨▨	▨▨

16

SECONDARY MATH I // MODULE 4
SOLVING EQUATIONS AND INEQUALITIES – 4.4

4.4

READY. SET. GO!   Name   Period   Date

READY

Topic: Write an equation from a context. Interpret notation for inequalities.

Write an equation that describes the story. Then answer the question asked by the story.

$x = $ # square feet
$y = $ total

1. Virginia's Painting Service charges $10 per job and $0.20 per square foot. If Virginia earned $50 for painting one job, how many square feet did she paint at the job?

$y = .20x + 10$ $\dfrac{40}{.2} = \dfrac{.2x}{.2}$ $x = \boxed{200 \text{ ft}^2}$

$50 = .2x + 10$

Check
$50 = .2(200) + 10$
$50 = 40 + 10 \checkmark$

2. Renting the ice-skating rink for a party costs $200 plus $4 per person. If the final charge for Dane's birthday party was $324, how many people attended his birthday party?

$324 = 200 + 4(31)$
$324 = 200 + 124$
$\checkmark$

Indicate if the following statements are <u>true</u> or <u>false</u>. Explain your thinking.

3. The notation $12 < x$ means the same thing as $x < 12$. It works just like $12 = x$ and $x = 12$.

False: $12 < 20$, but $20 > 12$.

4. The inequality $-2(x + 10) \geq 75$ says the same thing as $-2x - 20 \geq 75$. I can multiply by -2 on the left side without reversing the inequality symbol.

5. When solving the inequality $10x + 22 < 2$, the second step should say $10x > -20$ because I added -22 to both sides and I got a negative number on the right.

False: Reverse the symbol when multiplying or dividing BOTH SIDES by a negative number.

6. When solving the inequality $-5x \geq 45$, the answer is $x \leq -9$ because I divided both sides of the inequality by a negative number.

7. The words that describe the inequality $x \geq 100$ are "*x is greater than or equal to 100.*"

True

SET

Topic: Solve inequalities. Verify that given numbers are elements of the solution set.

Solve for x. (Show your work.) Indicate if the given value of x is an element of the solution set.

8. $2x - 9 < 3$

Is this value part
of the solution set?

9. $4x + 25 > 13$ $x > -2$
          $ -25 \quad -25$
          $4x > -8$

Is this value part $x = -5;$ yes?   (no?)
of the solution set?

$-5 > -2$

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10. $6x - 4 \leq -28$

Is this value part
of the solution set?   no?

11. $3x - 5 \geq -5$
$+5 \quad +5$

$3x > 0$
$x > 0$

Is this value part
of the solution set? $x = 1;$ (yes?)   no?

$1 > 0$

Solve each inequality and graph the solution on the number line.

12. $x + 9 \leq 7$

13. $-3x - 4 > 2$
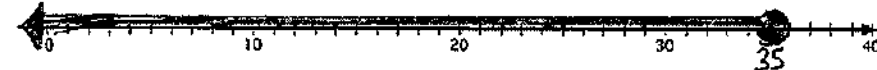$\dfrac{-3x}{-3} > \dfrac{6}{-3}$
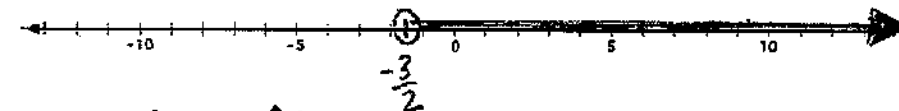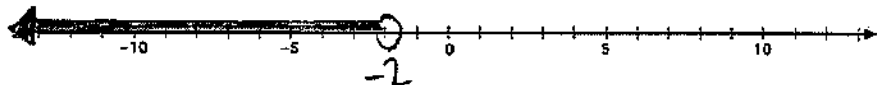$x < -2$

14. $3x < -6$

15. $\dfrac{x}{5} > -\dfrac{3}{10}$
$x > -\dfrac{3}{2}$

16. $-10x > 150$

17. $(-7)\dfrac{x}{-7} \geq -5(-7)$
$x \leq 35$

Solve each multi-step inequality.

18. $x - 5 > 2x + 3$

19. $\dfrac{3(x-4)}{12} \leq \dfrac{2x}{3}$

$3(x - 4) \leq 8x$
$3x - 12 \leq 8x$
$-12 \leq 5x$
$\dfrac{-12}{5} \leq \dfrac{5x}{5}$
$-\dfrac{12}{5} \leq x$

OR

$x \geq -\dfrac{12}{5}$

20. $2(x - 3) \leq 3x - 2$

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GO

Topic: Use substitution to solve linear systems

Solve each system of equations by using substitution.

Example: $\begin{cases} y = 12 \\ 2x - y = 14 \end{cases}$

The first equation states that $y = 12$. That information can be used in the second equation to find the value of x by replacing y with 12. The second equation now says $2x - (12) = 14$. Solve this new equation by adding 12 to both sides and then dividing by 2. The result is $x = 13$.

21. $\begin{cases} \boxed{y = 5} \\ -x + y = 1 \end{cases}$

$-x + (5) = 1$
$\quad -5 \quad -5$
$\overline{\quad -x = -4 \quad}$ $(4, 5)$
$\quad \frac{-x}{-1} = \frac{}{}$
$\boxed{x = 4}$

22. $\begin{cases} x = 8 \\ 5x + 2y = 0 \end{cases}$

23. $\begin{cases} 2y = 10 \rightarrow y = 5 \\ 4x - 2y = 50 \end{cases}$

$4x - 2(5) = 50$
$4x - 10 = 50$ $(15, 5)$
$4x = 60$
$x = 15$

24. $\begin{cases} 3x = 12 \rightarrow \\ 4x - y = 5 \end{cases}$

25. $\begin{cases} y = 2x - 5 \\ y = x + 8 \end{cases}$

$2x - 5 = x + 8$
$-x \qquad -x$
$\overline{\quad x - 5 = 8 \quad}$
$\quad +5 \quad +5$
$\overline{\quad x = 13 \quad}$

$y = 2(13) - 5$
$y = 26 - 5$
$y = 21$

$(13, 21)$

26. $\begin{cases} 3x = 9 \\ 5x + y = -5 \end{cases}$

SECONDARY MATH I // MODULE 4

SOLVING EQUATIONS AND INEQUALITIES – 4.5

4.5

▶ READY, SET, GO! Name Period Date

READY

Topic: Interpret phrases that imply an inequality.

Rewrite the given "word sentence" as a "math sentence." Each math sentence will use one of the following symbols: $>$, $<$, $\leq$, $\geq$. Use "x" in place of the number.

	Word Sentence	Math Sentence
Example:	I am thinking of a number that is greater than 13.	$x > 13$
1.	I am thinking of a number that is at least 13.	$X \geq 13$
2.	I am thinking of a number that is no fewer than 13.	▮▮▮▮
3.	I am thinking of a number that does not exceed 13.	$X \leq 13$
4.	I am thinking of a number that is at most 13.	▮▮▮
5.	I am thinking of a number that is no more than 13.	$X \leq 13$
6.	I am thinking of a number that is fewer than 13.	▮▮▮
7.	I am thinking of a number that is not above 13.	$X \leq 13$
8.	I am thinking of a number that is less than 13.	▮▮▮
9.	I am thinking of a number that is not under 13.	$X \geq 13$
10.	I am thinking of a number that is not greater than 13.	▮▮▮

SET

Topic: Write and solve inequalities from a context.

11. To take sweepstakes for the largest pumpkin crop at the Riverside County Fair, the average weight of Ethan's two pumpkins must be greater than 875 lbs. One of his pumpkins weighs 903 lbs. What is the least amount of pounds the second pumpkin could weigh in order for Ethan to win the prize?

   a) Write an inequality that models this situation. Be sure to define your variables. $\dfrac{903+X}{2} > 875$
   $X = $ Pumpkin 2

   b) Describe in words the quantities that would work in this situation.
   Ethan's 2nd pumpkin must weigh more than 847 pounds
   $903 + X > 1750$
   $X > 847$

   c) Write your answer in both interval and set notation.
   Interval: $(847, \infty)$ Set: $\{X \mid X \in \mathbb{R}, X > 847\}$

12. The average of Aaron's three test scores must be at least 93 to earn an A in the class. Aaron scored 89 on the first test and 94 on the second test. What scores can Aaron get on his third test to guarantee an A in the class? (The highest possible score is 100.)

   a) Write and solve an inequality that models this situation. Be sure to define your variables.
   ▮▮▮▮▮▮▮▮▮▮ $\longrightarrow$ ▮▮▮▮▮

   b) Describe in words the quantities that would work in this situation. ▮▮▮▮

   c) Write your answer in both interval and set notation.
   ▮▮▮▮▮▮▮▮▮▮▮▮▮

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SECONDARY MATH I // MODULE 4
SOLVING EQUATIONS AND INEQUALITIES – 4.5

4.5

1st $y = 35.99$

2nd $y = 19.99 + .25x$

13. A cell phone company offers a plan that costs $35.99 and includes unlimited texting. Another company offers a plan that costs $19.99 and charges $0.25 per text. For what number of texts does the second company's plan cost more than the first company's plan?

x = # texts
y = cost of plan

a) Write and solve an inequality that models this situation. Be sure to define your variables.

$19.99 + .25x > 35.99$ $.25x > 16$ $x > 64$

b) Describe in words the quantities that would work in this situation.

The second plan costs more from 65 texts and up

c) Write your answer in both interval and set notation.

interval: $(64, \infty)$
OR
$[65, \infty)$

SET: $\{x \mid x \in I, x > 64\}$
OR
$\{x \mid x \in I, x \geq 65\}$

GO

Topic: Use substitution to solve linear systems

Solve each system of equations by using substitution.

Example: $\begin{cases} y = x + 3 \\ 2x - y = 14 \end{cases}$

The first equation states that y = x + 3. That information can be used in the second equation to find the value of x by replacing y with x + 3. The second equation now says 2x − (x + 3) = 14. Solve this new equation by first distributing the negative over (x + 3). The new equation will be 2x − x − 3 = 14. Combine like terms. You will get the equivalent equation x − 3 = 14. Add 3 to both sides. You should get x = 17. But you still don't know the value of y. Now that you know the value of x, you can use either equation to figure out the value of y. Since the first equation is simpler, you may want to substitute the known value of x (recall that x = 17) into it. It should be easy to see what y equals. y = (17) + 3 = 20.

21. $\begin{cases} y = x + 5 \\ 2x + y = -1 \end{cases}$
$y = -2 + 5$
$y = 3$

$2x + (x + 5) = -1$ $\dfrac{3x}{3} = \dfrac{-6}{3}$
$2x + x + 5 = -1$ $x = -2$ $\boxed{(-2, 3)}$
$3x + 5 = -1$
$ -5 -5$

23. $\begin{cases} y = 10 - x \\ 4x - 2y = 40 \end{cases}$

$4x - 2(10 - x) = 40$ $y = 10 - 10$
$4x - 20 + 2x = 40$ $y = 0$
$6x - 20 = 40$
$6x = 60$ $\boxed{(10, 0)}$
$x = 10$

22. $\begin{cases} x = y - 1 \\ 5x + 2y = 9 \end{cases}$

24. $\begin{cases} x = 1 + y \\ 4x - y = 7 \end{cases}$

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SECONDARY MATH 1 // MODULE 4

SOLVING EQUATIONS AND INEQUALITIES - 4.6

4.6

> **READY, SET, GO!**   Name   Period   Date

READY

y = cost of trips
x = # of visits

y = 25x

Topic: Solving equations and inequalities from a context.

Write the given situation as an equation or inequality and then solve it.

1. The local amusement park sells summer memberships for $50 each. Normal admission to the park costs $25; admission for members costs $15. *y = 50 + 15x*

   a. If Darren wants to spend no more than $100 on trips to the amusement park this summer, how many visits can he make if he buys a membership with part of that money?

   $$50 + 15x \le 100 \qquad 15x \le 50 \qquad x \le \tfrac{10}{3} \qquad x \le 3\tfrac{1}{3} \qquad \boxed{3 \text{ visits}}$$

   b. How many visits can he make if he pay normal admission instead?

   $$25x \le 100 \qquad x \le 4 \qquad \boxed{4 \text{ visits}}$$

   c. If he increases his budget to $160, how many visits can he make as a member?

   $$50 + 15x \le 160 \qquad 15x \le 110 \qquad x \le 7\tfrac{1}{3} \qquad \boxed{7 \text{ visits}}$$

   d. How many can he make as a non-member with the increased budget of $160?

   $$25x \le 160 \qquad x \le 6.4 \qquad \boxed{6 \text{ visits}}$$

2. Jade just took a math test with 20 questions, each question is worth an equal number of points. The test is worth 100 points total.

   a. Write an equation that can be used to calculate Jade's score based on the number of questions she got right on the test.

   b. If a score of 70 points earns a grade of *C-*, how many questions would Jade need to get right to get at least a *C-* on the test?

   c. If a score of 83 points earns a grade of *B*, how many questions would Jade need to get right to get at least a *B* on the test?

   d. Suppose Jade got a score of 60% and then was allowed to retake the test. On the retake, she got all the questions right that she got right the first time, and also got half the questions right that she got wrong the first time. What percent of the questions did Jade get right, in total, on the retake?

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SET

Topic: Solve and justify one variable inequalities

Solve each inequality, justifying each step you use.

3.

$-5x < 35$	Justification
$\overline{-5} \quad \overline{-5}$ $x > -7$	Division Property of Inequality

4.

$x + 68 \geq 75$	Justification
▮▮▮	▮▮▮

5.

$2x - 4 \leq 10$	Justification
$+4 \quad +4$ $\dfrac{2x}{2} \leq \dfrac{14}{2}$ $x \leq 7$	Addition Prop of Ineq. Division Prop of Ineq.

6.

$5 - 4x \leq 17$	Justification
▮▮▮	▮▮▮

7.

$\dfrac{x}{-3} > -\dfrac{10}{9}$	Justification
$\left(-3\right)\left(\dfrac{x}{-3}\right) > \left(\dfrac{10}{9}\right)\left(-3\right)$ $\downarrow$ $x < \dfrac{10}{3}$	Multiplication Prop of Ineq.

8.

$2(x - 3) \leq 3x - 2$	Justification
▮▮▮	▮▮▮

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Solve each inequality and graph the solution on the number line.

9. $x - 8 > -20$

$\underline{\quad + 8 \quad +8 \quad}$

$x > -12$
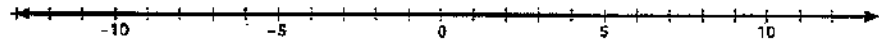
10. $x + 11 > 13$

Solve each multi-step inequality.

11. $4x + 3 < -1$

$\underline{\quad -3 \quad -3 \quad}$

$\dfrac{4x}{4} < \dfrac{-4}{4}$

$\boxed{x < -1}$

12. $4 - 6x \le 2(2x + 3)$
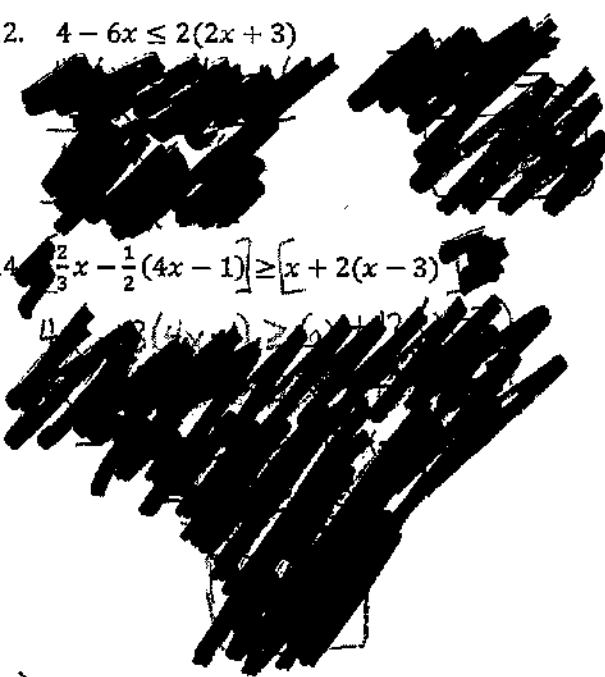
13. $5(4x + 3) \ge 9(x - 2) - x$

$20x + 15 \ge 9x - 18 - x$

$20x + 15 \ge 8x - 18$

$\underline{-8x - 15 \qquad -8x - 15}$

$\dfrac{12x}{12} \ge \dfrac{-33}{12}$

$\boxed{x \ge \dfrac{-11}{4}}$

14. $\dfrac{2}{3}x - \dfrac{1}{2}(4x - 1) \ge x + 2(x - 3)$
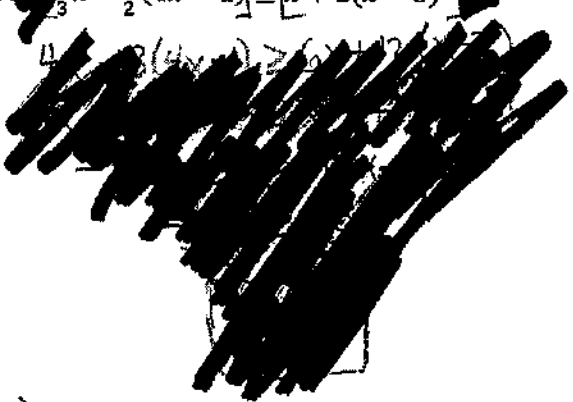
Topic: Solve literal equations

15. Solve the following equation for C: $F = \dfrac{9}{5}C + 32$

$\dfrac{5}{9}(F - 32) = \dfrac{9}{5}C \left(\cdot \dfrac{5}{9}\right)$ $C = \dfrac{5}{9}(F - 32)$

16. Given $V = \dfrac{1}{3}\pi r^2 h$,   rewrite the formula to isolate the variable r.

17. The area formula of a regular polygon is $A = \dfrac{1}{2}Pa$. The variable a represents the apothem and P represents the perimeter of the polygon. Solve the equation for the apothem, a.

$2 \cdot A = \left(\dfrac{1}{2}Pa\right) 2$

$\dfrac{2A}{P} = \dfrac{Pa}{P}$ $\boxed{a = \dfrac{2A}{P}}$

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18. The equation $y = mx + b$ is the equation of a line. Isolate the variable b.

~~[scribbled out]~~

19. The equation for the circumference c of a circle with radius r is $c = 2\pi r$. Solve the equation for the radius, r.

$$\frac{C}{2\pi} = \frac{2\pi r}{2\pi} \quad \rightarrow \quad \boxed{r = \frac{C}{2\pi}}$$

20. The equation for the area of a circle A based on diameter d is $A = \pi \frac{d^2}{4}$. Solve the equation to isolate the diameter, d.
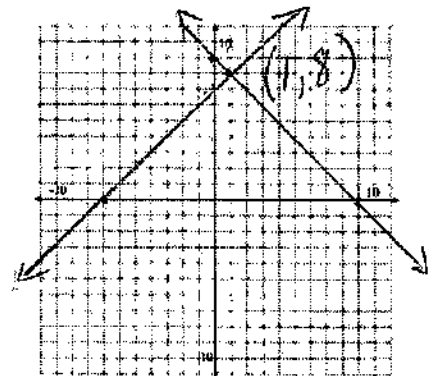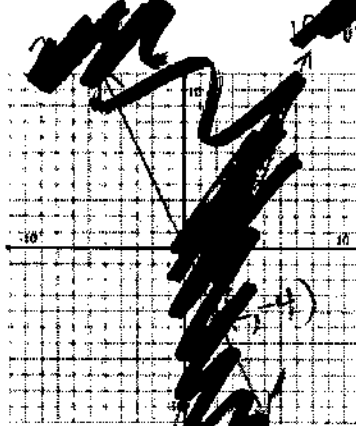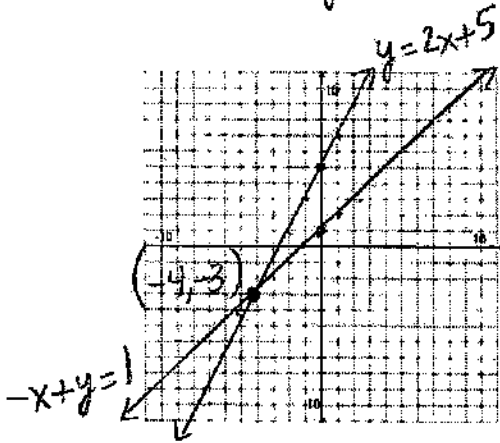
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GO

Topic: Solve systems of equations by graphing

Graph both lines on the same coordinate grid. Identify the point of intersection. Then test the x and y values of the point of intersection in the two equations.

21. $\begin{cases} y = 2x + 5 \\ -x + y = 1 \end{cases}$

$y = x + 1$

$y = 2x + 5$

$-x + y = 1$

$(-4, -3)$

22. $\begin{cases} 10 + y = 3x \\ 2x + y = 0 \end{cases}$

~~[scribbled out]~~

23. $\begin{cases} x + y = 9 \\ x - y = -7 \end{cases}$

$(1, 8)$

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

$-3 = 2(-4) + 5$ $-(-4) - 3 = 1$

$-3 = -8 + 5$ $4 - 3 = 1$

✓   ✓

$x + y = 9$ $x - y = -7$

$1 + 8 = 9$ $1 - 8 = -7$

✓ $-7 = -7$

✓