Accelerated Coordinate Algebra

Name _____

Benchmark 1--Study Guide

Date _____ Period ____

Solve each equation.

1) $2a + 6 - 6 - 3 = 1 + a + 4$

$2a - 3 = a + 5$
$-a + 3 \quad -a + 3$
$a = 8$

2) $6 - 5n + 3n = 14 - 2n$

$6 - 2n = 14 - 2n$
$-6 + 2n \quad -6 + 2n$
$0 = 8$ X

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3) $-4p - 15 = 5 - 6(2p + 6)$

$-4p - 15 = 5 - 12p - 36$
$-4p - 15 = -31 - 12p$
$+12p + 15 \quad +15 \quad +12p$
$8p = -16$
$p = -2$

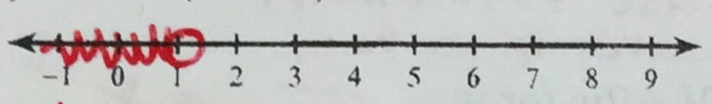
4) $-2(-2k + 4) = -8 - 4k$

$4k - 8 = -8 - 4k$
$+4k + 8 \quad +8 \quad +4k$
$8k = 0$
$k = 0$

Solve each inequality and graph its solution.

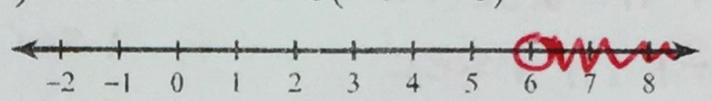
5) $6x - 6(7 + 8x) > -84$

$6x - 42 - 48x > -84$
$-42x - 42 > -84$
$+42 \quad +42$
$\frac{-42x}{-42} > \frac{-42}{-42}$
$x < 1$



6) $-168 > 4v - 6(4v + 8)$

$-168 > 4v - 24v - 48$
$-168 > -20v - 48$
$+48 \quad +48$
$\frac{-120}{-20} > \frac{-20v}{-20}$
$6 < v$ $\quad v > 6$



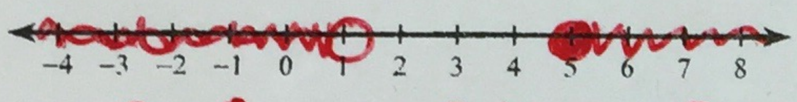
Solve each compound inequality and graph its solution.

7) $m + 3 \geq 8$ or $-8 + 6m < -2$

$m + 3 \geq 8$
$-3 \quad -3$
$m \geq 5$

or

$-8 + 6m < -2$
$+8 \quad +8$
$6m < 6$
$m < 1$

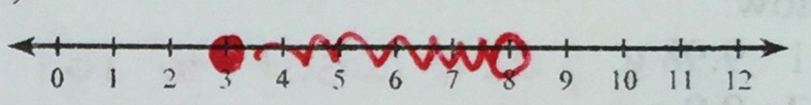


8) $-r + 9 \leq 6$ and $9r - 9 < 63$

$-r + 9 \leq 6$
$-9 \quad -9$
$-r \leq -3$
$r \geq 3$

and

$9r - 9 < 63$
$+9 \quad +9$
$9r < 72$
$r < 8$



Solve each system by graphing.

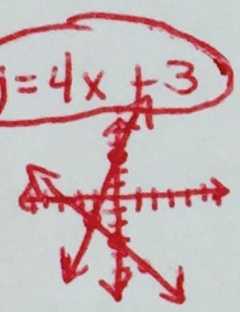
9) $-9 + 3y = 12x$
$2x + 3 = -y$

* get y-alone *

$\frac{3y}{3} = \frac{12x}{3} + \frac{9}{3} \rightarrow y = 4x + 3$

$y = -2x - 3$

$(-1, -1)$



10) $-9y = -3x - 18$
$3y - x = 6$

$\frac{-9y}{-9} = \frac{-3x}{-9} - \frac{18}{-9} \rightarrow y = \frac{1}{3}x + 2$

$3y - x = 6 \rightarrow \frac{3y}{3} = \frac{x}{3} + \frac{6}{3} \rightarrow y = \frac{1}{3}x + 2$

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- they are the same line

Solve each system by substitution.

11) $x - 7y = -2$
$-8x - y = 16$

$x = 7y - 2$

$-8(7y - 2) - y = 16$
$-56y + 16 - y = 16$
$-57y = 0$
$y = 0$

$x = 7(0) - 2$
$x = -2$

$(-2, 0)$

12) $x + y = -5$
$-7x - 4y = 14$

$y = -x - 5$

$-7x - 4(-x - 5) = 14$
$-7x + 4x + 20 = 14$
$-3x = -6$
$x = 2$

$y = -2 - 5$
$y = -7$

$(2, -7)$

Solve each system by elimination.

13) $4x + 12y = -16$
$-2(-5x + 6y = 20)$

$4x + 12y = -16$
$10x - 12y = -40$
$14x = -56$
$x = -4$

$4(-4) + 12y = -16$
$-16 + 12y = -16$
$+16 \quad +16$
$12y = 0$
$y = 0$

$(-4, 0)$

14) $-3x - y = -6$
$-21x - 7y = -14$

$y = -3x + 6$

$-21x - 7(-3x + 6) = -14$
$-21x + 21x - 42 = -14$
$-42 = -14$ X

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15) Mary's school is selling tickets to a play. On the first day of ticket sales the school sold 7 senior citizen tickets and 12 child tickets for a total of $161. The school took in $130 on the second day by selling 8 senior citizen tickets and 6 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

S-senior
C-child

$7s + 12c = 161$
$-2(8s + 6c = 130)$

$7s + 12c = 161$
$-16s - 12c = -260$
$-9s = -99$ $\quad s = 11$

$7(11) + 12c = 161$
$77 + 12c = 161$
$12c = 84$
$c = 7$

senior = $11
child = $7

16) The senior classes at High School A and High School B planned separate trips to Yellowstone National Park. The senior class at High School A rented and filled 5 vans and 2 buses with 157 students. High School B rented and filled 10 vans and 11 buses with 706 students. Each van and each bus carried the same number of students. Find the number of students in each van and in each bus.

v-van
b-bus

$-2(5v + 2b = 157)$
$10v + 11b = 706$
$-10v - 4b = -314$
$7b = 392$ $\quad b = 56$

$5v + 2(56) = 157$
$5v + 112 = 157$
$5v = 45$
$v = 9$

bus = 56
van = 9

Solve each proportion.

17) $\frac{3}{x} = \frac{10}{6}$ $10x = 18$ $[x = 1.8]$

18) $\frac{9}{4} = \frac{n+4}{10}$ $4(n+4) = 90$ $4n + 16 = 90$ $4n = 74$ $[n = 18.5]$

19) A rectangle has a length of $x + 2$ inches and a width of 5 inches. For what values of x is the area of the rectangle greater than the perimeter of the rectangle? Draw a diagram to help.

$A = L \cdot w$ $P = 2L + 2w$ $A > P$

$(x+2)(5) > 2(x+2) + 2(5)$

$5x + 10 > 2x + 4 + 10$

$5x + 10 > 2x + 14$

$5x + 10 > 2x + 14$

$-2x \quad -10 \quad -2x \quad -10$

$3x > 4$

$[x > 4/3]$

20) A model airplane flies 18 feet in 2 seconds. What is the airplane's speed in miles per hour? Round your answer to the nearest hundredth.

18 ft in 2 sec → 9 ft in 1 sec

$\frac{9\text{ ft}}{1\text{ sec}} = \frac{?}{3600\text{ sec}} \rightarrow \frac{32{,}400\text{ ft}}{5280\text{ ft (in a mile)}}$ ← seconds in an hour

$[6.14]$

21) Solve $\frac{m}{n} = p - 5$ for n.

just switch

$\left[\frac{m}{p-5} = n\right]$

22) Solve $P = 2l + 2w$ for w.

$-2l \quad -2l$

$P - 2l = 2w$

$\frac{P-2l}{2} = \frac{2w}{2}$

$\left[\frac{P-2l}{2} = w \text{ or } \frac{P}{2} - l = w\right]$

23) Sarah is comparing five different scales using a standard mass that is exactly 10 grams. Her results are below:

Scale 1 : 9.98 g .02 ← closest to 10
Scale 2 : 9.9 g .1
Scale 3 : 10.1 g .1
Scale 4 : 10.3 g .3
Scale 5 : 9.8 g .2

Which scale is the most precise? 1

Which scale is the most accurate? 1

24) A triangle has side lengths of 5 inches, 10 inches, and 15 inches. Every dimension is multiplied by $\frac{1}{5}$ to form a new triangle.

What is the scale factor? 1/5

What is the ratio of the corresponding sides of the first figure to the second figure? 1/5

What is the ratio of the perimeters? 1/5

What is the ratio of the areas? 1/25 ← square

25) A contractor has a blueprint for a house drawn to the scale 1 in : 3 ft. A wall on the blueprint is 6.5 inches long. How long is the actual wall?

$\frac{1\text{ in}}{3\text{ ft}} = \frac{6.5\text{ in}}{x}$ $[x = 19.5\text{ ft}]$