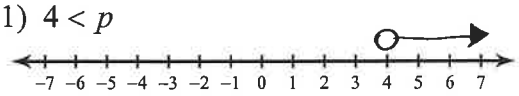
Algebra 1 Name Key

Unit 3 Study Guide

Date _____ Period ____

Write the inequality IN WORDS, give 2 possible solutions, and draw a graph for each inequality.

1) $4 < p$



4 is less than p

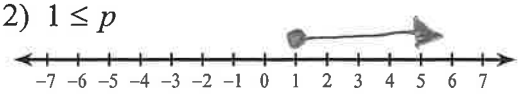
or

p is greater than 4

possibilities

5, 10, 50

2) $1 \leq p$



1 is less than or equal to p

or

p is greater than or equal to 1

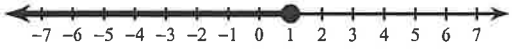
possibilities 1, 2, 3

Write an inequality for each graph.

3)

$X \geq -2$ or $-2 \leq X$

4)



$X \leq 1$ or $1 \geq X$

Write an inequality that represents the scenario.

5) You must be at least 25 years old to rent a car.

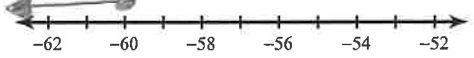
$X \geq 25$

6) You must be less than 6.5 ft to ride the roller coaster.

$X < 6.5$

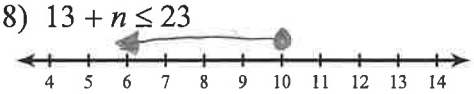
Solve each inequality and graph its solution.

7) $\frac{5}{5}(-12) \geq \frac{v}{5}\cdot 5$



$-60 \geq v$

8) $13 + n \leq 23$

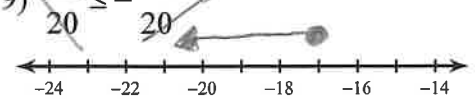


$13 + n \leq 23$

$-13 \quad -13$

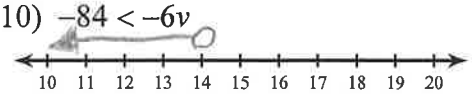
$n \leq 10$

9) $\frac{m}{20} \leq -\frac{17}{20}$ (20)



$m \leq -17$

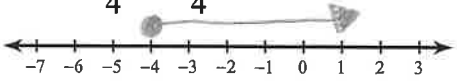
10) $-84 < -6v$



$\frac{-84}{-6} < \frac{-6v}{-6}$ sign flip

$14 > v$

11) $n - \frac{1}{4} \geq -\frac{17}{4}$

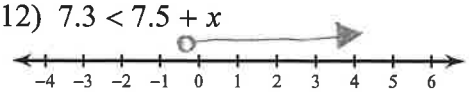


$n - \frac{1}{4} \geq -\frac{17}{4} + \frac{1}{4}$

$+\frac{1}{4}$

$n \geq \frac{-16}{4}$ → $n \geq -4$

12) $7.3 < 7.5 + x$

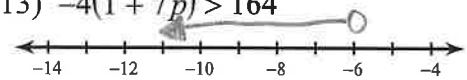


$7.3 < 7.5 + x$

$-7.5 \quad -7.5$

$-0.2 < x$

13) $-4(1 + 7p) > 164$



$-4 - 28p > 164$

$+4 \quad +4$

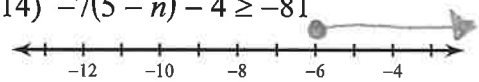
$-28p > 168$

$\div -28 \quad \div -28$

(*sign flip)

$p < -6$

14) $-7(5 - n) - 4 \geq -81$



$-35 + 7n - 4 \geq -81$

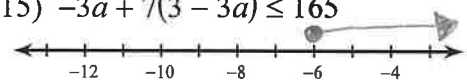
$7n - 39 \geq -81$

$+39 \quad +39$

$\frac{7n}{7} \geq \frac{-42}{7}$

$n \geq -6$

15) $-3a + 7(3 - 3a) \leq 165$



$-3a + 21 - 21a \leq 165$

$-24a + 21 \leq 165$

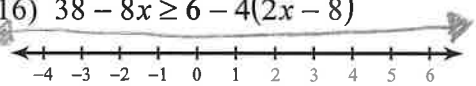
$-21 \quad -21$

$\frac{-24a}{-24} \leq \frac{144}{-24}$

(*sign flip)

$a \geq -6$

16) $38 - 8x \geq 6 - 4(2x - 8)$



all numbers

$38 - 8x \geq 6 - 8x + 32$

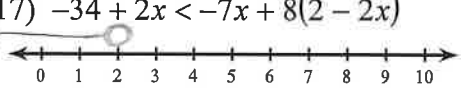
$38 - 8x \geq 38 - 8x$

$+8x \quad +8x$

$38 \geq 38$

infinite

17) $-34 + 2x < -7x + 8(2 - 2x)$



$-34 + 2x < -7x + 16 - 16x$

$-34 + 2x < -23x + 16$

$+23x \quad +23x$

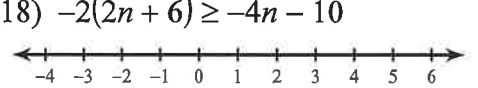
$-34 + 25x < 16$

$+34 \quad +34$

$\frac{25x}{25} < \frac{50}{25}$

$x < 2$

18) $-2(2n + 6) \geq -4n - 10$



no numbers

$-4n - 12 \geq -4n - 10$

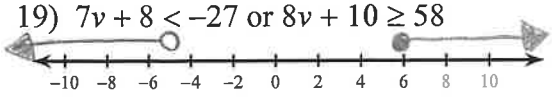
$+4n \quad +4n$

$-12 \geq -10$ X False!

No Solution

Solve each compound inequality and graph its solution.

19) $7v + 8 < -27$ or $8v + 10 \geq 58$



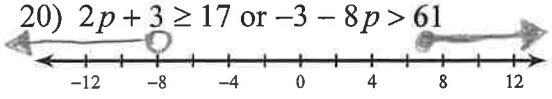
$7v + 8 < -27$ | $8v + 10 \geq 58$

$-8 \quad -8$ | $-10 \quad -10$

$\frac{7v}{7} < \frac{-35}{7}$ | $\frac{8v}{8} \geq \frac{48}{8}$

$v < -5$ OR $v \geq 6$

20) $2p + 3 \geq 17$ or $-3 - 8p > 61$



$2p + 3 \geq 17$ | $-3 - 8p > 61$

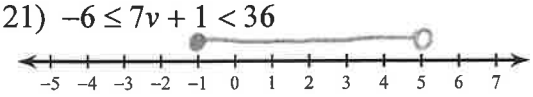
$-3 \quad -3$ | $+3 \quad +3$

$\frac{2p}{2} \geq \frac{14}{2}$ | $\frac{-8p}{-8} > \frac{64}{-8}$

*sign flip

$p \geq 7$ OR $p < -8$

21) $-6 \leq 7v + 1 < 36$



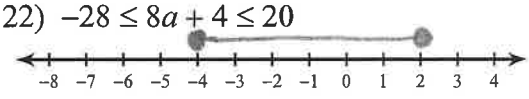
$-6 \leq 7v + 1 < 36$

$-1 \quad -1 \quad -1$

$\frac{-7}{7} \leq \frac{7v}{7} < \frac{35}{7}$

$-1 \leq v < 5$

22) $-28 \leq 8a + 4 \leq 20$



$-28 \leq 8a + 4 \leq 20$

$-4 \quad -4 \quad -4$

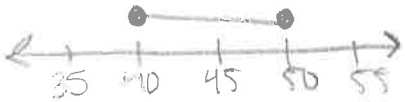
$\frac{-32}{8} \leq \frac{8a}{8} \leq \frac{16}{8}$

$-4 \leq a \leq 2$

23) Jill needs to drive within 5 miles per hour of the speed limit to avoid a ticket. If the speed limit is 45 mph, WRITE and GRAPH a compound inequlity to represent how fast she could drive.

inclusive

$40 \leq x \leq 50$



Write and solve an inequality for the following scenarios. Write your final answer in WORDS.

24) Students need at least 75 hours of community service for graduation. Shawn has completed 48 hours already. How many more hours does he need to complete?

$x + 48 \geq 75$

$-48 \quad -48$

$x \geq 27$

Inequality: $x + 48 \geq 75$

Answer: He needs at least 27 more hours.

25) Marco needs to buy premium gas for his car, which is \$2.25 a gallon. He has \$20 in his wallet. How many gallons of gas can he get?

$\frac{2.25x}{2.25} \leq \frac{20}{2.25}$

$x \leq 8.\overline{8}$

* can't round up because it's less than

Inequality: $2.25x \leq 20$

Answer: Marco can put no more than 8.8 gallons in his car.

26) Dan needs to rent a moving van for the day. Company A charges $75 plus $0.25 per mile driven. Company B charges $50 plus $0.75 per mile driven. How many miles would he have to drive for Company B to be LESS than Company A?

A: $75+.25m$
B: $50+.75m$

$A > B$

$75+.25m > 50+.75m$

$-.25m \quad -.25m$

$75 > 50+.5m$

$-50 \quad -50$

$25 > .5m$

$\div .5 \quad \div .5$

$50 > m$

m = miles

Inequality: $75+.25m > 50+.75m$

Answer: He must drive less than 50 miles for B to be less.

27) The science club wants to go to the Science Center, which has an admission price of $8 per person. There is currently $95 in their club fund, but they plan to raise another $150.

a.) Write a compound inequality that represents how many students could go (x = number of students)

$95 \leq 8x \leq 245$

$150 + 95 = 245$ in total (hopefully!)

b.) Solve the inequality and give a REASONABLE answer in words for how many students could go

$12 \leq x \leq 30$

They could bring anywhere from 12 to 30 people.

$\frac{95}{8} \leq \frac{8x}{8} \leq \frac{245}{8}$

$11.875 \leq x \leq 30.625$

c.) If they club wanted to bring 32 students and 2 adults, how much total money would they need?

They would need a total of $272.

$34 \cdot \$8 = \$272$

Solve each equation.

28) $|5n| - 1 = 29$

$+1 \quad +1$

$|5n| = 30$

$\frac{5n}{5} = \frac{30}{5} \quad \frac{5n}{5} = \frac{-30}{5}$

$n = 6$ or $n = -6$

29) $10|2 - 3b| = 100$

$\frac{10}{10}$

$2 - 3b = 10$ or $2 - 3b = -10$

$-2 \quad -2 \quad -2 \quad -2$

$-3b = 8 \quad -3b = -12$

$\frac{-3b}{-3} = \frac{8}{-3} \quad \frac{-3b}{-3} = \frac{-12}{-3}$

$b = -8/3$ or $b = 4$

Solve each inequality.

30) $|6 + k| + 1 \leq 12$

$-1 \quad -1$

$|6 + k| \leq 11$

$6 + k \leq 11 \quad 6 + k \geq -11$

$-6 \quad -6 \quad -6 \quad -6$

$k \leq 5 \quad k \geq -17$

$-17 \leq k \leq 5$

31) $8|b + 2| + 2 \geq 58$

$-2 \quad -2$

$\frac{8}{8}|b+2| \geq \frac{56}{8}$

$|b+2| \geq 7$

$b + 2 \geq 7 \quad b + 2 \leq -7$

$-2 \quad -2 \quad -2 \quad -2$

$b \geq 5$ or $b \leq -9$