Name: KEY Date: _____ Period: _____

P E MD AS

Solving Multi-Step Inequalities

<	≤	>	≥
• less than • fewer than	• less than or equal to • no more than • at most	• greater than • more than	• greater than or equal to • no less than • at least

I. Match a verbal statement with inequality statement.

1. A number increased by five is at most 6. D

2. A number divided by negative two is no less than 5. A

3. Five thirds of a number is more than -10. E

4. The sum of a number and 20 is greater than the product of -3 and that number. B

5. Four more than the quotient of a number and 3 is at least that number. C

A. $-\frac{a}{2} \geq 5$

B. $y + 20 > -3y$

C. $\frac{b}{3} + 4 \geq b$

D. $n + 5 \leq 6$

E. $\frac{5}{3}d > -10$

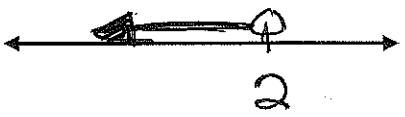
II. Solve each inequality and graph the solution set.

1. $7a - 5 < 9$

$+5 \quad +5$

$\frac{7a}{7} < \frac{14}{7}$

$a < 2$



2. $6 - 11b \leq -3$

$-6 \quad -6$

$\frac{-11b}{-11} \leq \frac{-9}{-11}$

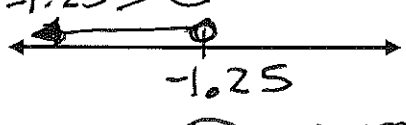
$b \geq \frac{9}{11}$

3. $15 < 5 - 8c$

$-5 \quad -5$

$\frac{10}{-8} < \frac{-8c}{-8}$

$-1.25 > c$



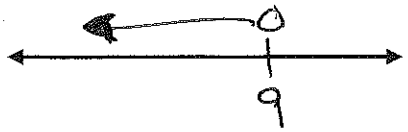
4. $\frac{d}{3} - 16 < -13$

$+16 \quad +16$

$\frac{d}{3} < 3$

$(3) \quad (3)$

$d < 9$



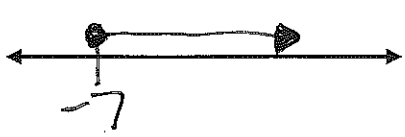
5. $\frac{(t-3)}{2} \geq -5$

$(2) \quad (2)$

$t - 3 \geq -10$

$+3 \quad +3$

$t \geq -7$



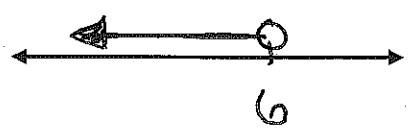
6. $4n - 6 > 6(n - 3)$ DISTR

$4n - 6 > 6n - 18$

$-6n \quad +6 \quad -6n \quad +6$

$\frac{-2n}{-2} > \frac{-12}{-2}$ flip

$n < 6$



III. Define the variable, write an inequality, and solve.

7. Gaby the gabber likes to text messages to her friends using her cell phone. She is charged $0.10 each time she types a message plus $50 for the phone plan. She is only allowed to have a bill that is at most $60. Write an inequality in terms of the number of messages, m, that she can text each billing cycle.

m: message

$10m + 50 \leq 60$
$-50 \quad -50$
$\frac{10m}{10} \leq \frac{10}{10}$
$m \leq 100$

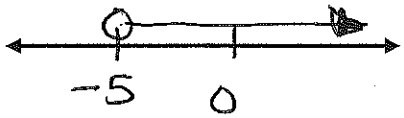
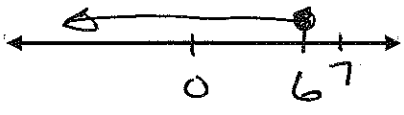
at most 100 messages

8. Jimmy started a savings account for an iPhone. He saved $30 last month and plans to add $20 each month until he has saved more than $300. Write an inequality in terms of the number of months, m, that he has to save for the iPhone.

$30 + 20m > 300$
$-30 \quad -30$
$20m > 270$
$\frac{20m}{20} > \frac{270}{20}$
$m > 13.5$

14 mos

IV. Graphing Inequalities: graph the solutions to the inequalities from section I.

1. $-\frac{a}{2} \geq 5$ $(-2)\ (-2)$ $a \leq -10$	
2. $y + 20 > -3y - 20$ $+3y \quad +3y$ $\frac{4}{4}y > \frac{-20}{4}$ $y > -5$	
3. $\frac{b}{3} + 4 \geq b - 4$ $-4 \quad -b$ $\frac{b}{3} \geq b - 8$ $3(\frac{b}{3} - b) \geq (-8)3$ $b - 3b \geq -12$ $\frac{-2b}{-2} \geq \frac{-12}{-2}$ $b \leq 6$	
4. $n + 5 \leq 6$ $-5 \quad -5$ $n \leq 1$	
5. $\frac{3}{5}d > -10(\frac{3}{5})$ $d > -6$