

## Unit 6: Inequalities

Name: Key

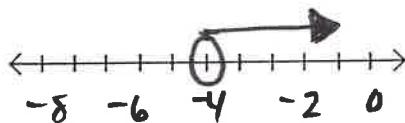
## Pre-Algebra: Practice Test

Hour: \_\_\_\_\_

## 6.1: I can solve and graph one-step inequalities with addition and subtraction.

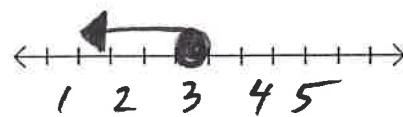
1.  $x + 8 > 4$

$x + 8 - 8 > 4 - 8$   
 $x > -4$



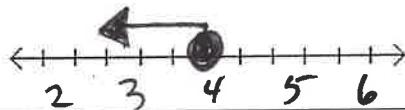
2.  $p - 6 \leq -3$

$p - 6 + 6 \leq -3 + 6$   
 $p \leq 3$

2 pts  
ea

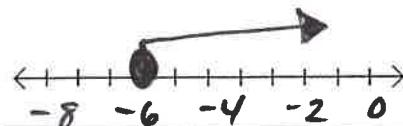
3.  $k - 14 \leq -10$

$k - 14 + 14 \leq -10 + 14$   
 $k \leq 4$



4.  $s + 1 \geq -5$

$s + 1 - 1 \geq -5 - 1$   
 $s \geq -6$

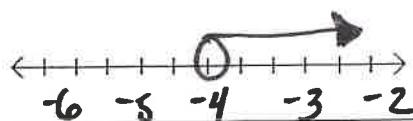
Score: 8 pts. %

## 6.2: I can solve and graph one-step inequalities with multiplication and division.

1.  $-6x < 24$

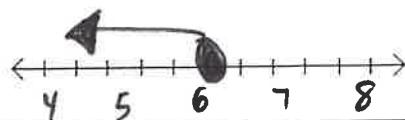
$\frac{-6x}{-6} < \frac{24}{-6}$   
 $x > -4$

\* Switch the sign!



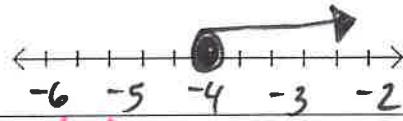
(2)  $\frac{x}{2} \leq 3$

$(2) \cdot 2 \leq 3(2)$   
 $x \leq 6$



2.  $4x \geq -16$

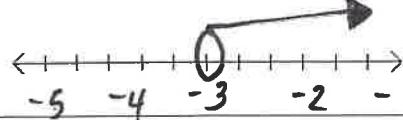
$\frac{4x}{4} \geq \frac{-16}{4}$   
 $x \geq -4$



(3)  $1 > -\frac{x}{3}$

$(-3) \cdot 1 > -\frac{x}{3} \cdot (-3)$   
 $-3 < x$

\* Switch the sign!

2 pts  
eaScore: 8 pts. %

6.3: I can solve multiple-step inequalities.

1.  $5 + x - 9 \geq 4$

$$\begin{array}{rcl} x - 4 + 4 & \geq & 4 + 4 \\ x & \geq & 8 \end{array}$$

3.  $-8(x + 3) \leq 16$

$$\begin{array}{rcl} -8x - 24 + 24 & \leq & 16 + 24 \\ -8x & \leq & 40 \\ x & \geq & -5 \end{array}$$

5.  $\frac{2x-1}{3} \geq 1$  (3)

$$\begin{array}{rcl} 2x - 1 + 1 & \geq & 3 + 1 \\ 2x & \geq & 4 \\ x & \geq & 2 \end{array}$$

(2s)  $\frac{-3x+6}{-5} \leq -3$  (-5)

$$\begin{array}{rcl} -3x + 6 & \geq & 15 - 6 \\ -3x & \geq & 9 \\ x & \leq & -3 \end{array}$$

\*switch the sign twice!

3 pts ea

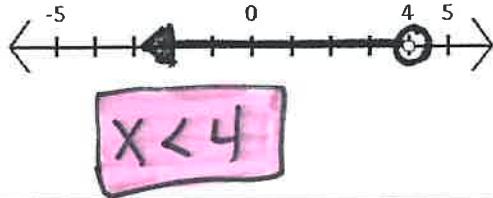
4.  $3x - 7x + 2 < 10 - 12$

$$\begin{array}{rcl} -4x + 2 - 2 & < & -2 - 2 \\ -4x & < & -4 \\ x & > & 1 \end{array}$$

\*switch the sign!

Write an inequality representing the graph provided.

7.



$$x < 4$$

8.



$$x \geq -8$$

1 pt ea

Score: 20 pts %

6.4: I can solve inequalities that have variables on both sides.

1.  $2(x - 3) + 4 \geq x + 12$

$$\begin{array}{rcl} 2x - 6 + 4 & \geq & x + 12 \\ 2x - 2 - x & \geq & x + 12 - x \\ x - 2 + 2 & \geq & 12 + 2 \\ x & \geq & 14 \end{array}$$

2.  $3(4x - 1) \leq 12x + 25$

$$\begin{array}{rcl} 12x - 3 - 12x & \leq & 12x + 25 - 12x \\ 0x - 3 + 3 & \leq & 25 + 3 \\ 0x & \leq & 28 \end{array}$$

ARN

3 pts ea

3.  $-9(x+2) < -6x - 3(x+8)$

$$\begin{aligned} -9x - 18 &< -6x - 3x - 24 \\ -9x - 18 + 9x &< -9x - 24 + 9x \\ 0x - 18 &< -24 + 18 \\ 0x &< -6 \\ \text{NS} \end{aligned}$$

4.  $3(12 + 2x) + 10 < 10x + 6$

$$\begin{aligned} 36 + 6x + 10 &< 10x + 6 \\ 6x + 46 - 10x &< 10x + 6 - 10x \\ -4x + 46 - 46 &< 6 - 46 \\ -4x &< -40 \\ \frac{-4x}{-4} &> \frac{-40}{-4} \\ x &> 10 \end{aligned}$$

\*switch the sign!

Score: 12 pts %

### 6.5: I can solve inequalities with fractions.

1.  $\frac{3}{5}x - \frac{11}{30} \geq -\frac{5}{6}$

LCM = 30

$$\begin{aligned} \left(\frac{30}{1}\right) \frac{3}{5}x - \frac{11}{30} \left(\frac{30}{1}\right) &\geq -\frac{5}{6} \left(\frac{30}{1}\right) \\ 18x - 11 + 11 &\geq -25 + 11 \\ \frac{18x}{18} &\geq \frac{-14}{18} \\ x &\geq -\frac{7}{9} \end{aligned}$$

2.  $-3\frac{2}{15} < -1 + \frac{4}{3}n$

LCM = 15

$$\begin{aligned} -\frac{47}{15} \left(\frac{15}{1}\right) &< -1 \left(\frac{15}{1}\right) + \frac{4}{3}n \left(\frac{15}{1}\right) \\ -47 + 15 &< -15 + 20n + 15 \\ -\frac{32}{20} &< \frac{20n}{20} \\ -\frac{13}{5} &< n \end{aligned}$$

3 pts ea

3.  $\frac{11}{4}x + 1 + \frac{5}{8}x < -\frac{13}{16}$

LCM = 16

$$\begin{aligned} \left(\frac{16}{1}\right) \frac{11}{4}x + 1 \left(\frac{16}{1}\right) + \frac{5}{8}x \left(\frac{16}{1}\right) &< -\frac{13}{16} \left(\frac{16}{1}\right) \\ 44x + 16 + 10x &< -13 \\ 54x + 16 - 16 &< -13 - 16 \\ \frac{54x}{54} &< \frac{-29}{54} \\ x &< -\frac{29}{54} \end{aligned}$$

4.  $-7n - \frac{15}{7} + 2\frac{6}{7} \geq -\frac{137}{14}$

LCM = 14

$$\begin{aligned} -7n \left(\frac{14}{1}\right) - \frac{15}{7} \left(\frac{14}{1}\right) + \frac{20}{7} \left(\frac{14}{1}\right) &\geq -\frac{137}{14} \left(\frac{14}{1}\right) \\ -98n - 30 + 40 &\geq -137 \\ -98n + 10 - 10 &\geq -137 - 10 \\ \frac{-98n}{-98} &\geq \frac{-147}{-98} \\ n &\leq 1.5 \end{aligned}$$

\*switch the sign!

Score: 12 pts %

### 6.6: I can solve story problems with inequalities.

1. Your club is in charge of making pins that students can buy to show their school spirit for the upcoming basketball game. You have made 225 pins so far, and you have only 2 hours left to make the rest of the pins. You need to make at least 400 pins. How many pins do you have to make per minute in order to reach your goal?

You must make at least 2 pins per minute

Pins made	+	Pins to make	→	Total
-225	225	+ 120m	↓	400 - 225
		120m	↓	175
		120	↓	120
			m	$\geq 1.458\bar{3}$

3pts ea

2. A car dealership sold 78 new cars and 65 used cars this year. The number of new cars sold by the dealership has been increasing by 6 cars each year. The number of used cars sold by the dealership has been decreasing by 4 cars each year. If these trends continue, in how many years will the number of new cars sold be more than twice the number of used cars sold?

In 4 years the new cars will be more than twice the used cars

$$\begin{array}{rcl}
 \text{New} & > & \text{2 Used} \\
 78 + 6y & \geq & 2(65 - 4y) \\
 78 + 6y + 8y & \geq & 130 - 8y + 8y \\
 78 + 14y & \geq & 130 - 78 \\
 14y & \geq & 52 \\
 \frac{14y}{14} & \geq & \frac{52}{14} \\
 y & > & 3.7
 \end{array}$$

3. An animal shelter has fixed weekly expenses of \$750. Each animal in the shelter costs an additional \$6 per week. During the summer months, the weekly expenses are at least \$1170. How many animals are at the shelter in the summer in order for the expenses to be at least \$1170 a week?

70 animals would be at the shelter

Fixed expenses	+	amt per week	≥	Total
-750	750	+ 6x	≥	1170 - 750
		6x	≥	420
		$\frac{6x}{6}$	≥	$\frac{420}{6}$
		x	≥	70

Score: 9 pts %

120 minutes