Notes: Solving Linear Inequalities

Solve and graph each solution using a number line.

1. $3x - 15 < 6$

$+15 \quad +15$

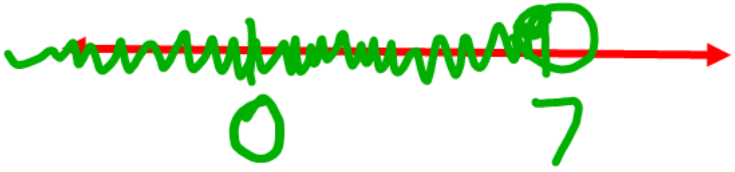
$\frac{3x}{3} < \frac{21}{3}$

$\boxed{x < 7}$

Left
Less than

$<, >$ ( )

$\leq, \geq$ ●



2. $-2x - 3 \geq -11 + 2x$

$-2x \qquad -2x$

$-4x - 3 \geq -11$

$+3 \qquad +3$

$-4x \geq -8$

$\frac{-4x}{-4} \geq \frac{-8}{-4}$

"Flip!"

$\boxed{x \leq 2}$

3. $17 - 3x \geq 35$

$-17 \qquad -17$

$-3x \geq 18$

$\frac{-3x}{-3} \geq \frac{18}{-3}$

$\boxed{x \leq -6}$

4. $1 + 5(x - 8) \leq 2 - 1(x + 5)$

$1 + 5x - 40 \leq 2 - x - 5$

$5x - 39 \leq -x - 3$

$+x \qquad +x$

$6x - 39 \leq -3$

$+39 \qquad +39$

$\frac{6x}{6} \leq \frac{36}{6}$

$\boxed{x \leq 6}$

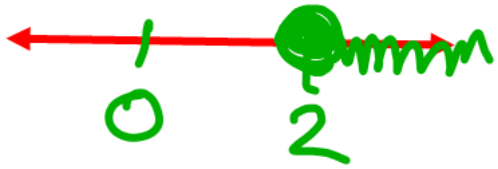
5. $6(5x - 7) \geq 18$

$30x - 42 \geq 18$

$+42 \quad +42$

$\frac{30x}{30} \geq \frac{60}{30}$

$\boxed{x \geq 2}$



Define the variables. Write and solve a linear inequality.

6. Mrs. Adams rented a truck to move some furniture. The rental charge is $120 per day plus $0.20 per mile. She wants to spend no more than $200, not including tax. What is the maximum number of miles that she can drive the truck?

$120 + 0.20m \leq 200$

$-120 \qquad -120$

$0.20m \leq 80$

$\frac{0.20m}{0.20} \leq \frac{80}{0.20}$

$m \leq 400$

400 mi.

7. Ron's scores on the first three of four 100-point chemistry tests were 90, 96, and 86. What score must he receive on the fourth test to have an average of at least 92 for all the tests?

$$\frac{t+90+96+86}{4} \geq 92$$

$$4 \cdot \frac{t+272}{4} \geq 92 \cdot 4$$

$$t+272 \geq 368$$

$$-272 \quad -272$$

$$\boxed{t \geq 96}$$

$\frac{5}{100} = .05$

8. Jane works at a store where she earns a base salary of $84 per week plus a commission of 5% of her sales. If Jane needs to make at least $324 per week to meet her bills, what is the minimum amount of sales she needs to make?

$84 + .05x \geq 324$

$-84 \qquad -84$

$.05x \geq 240$

$\frac{.05x}{.05} \geq \frac{240}{.05}$

$x \geq 4{,}800$

$4,800