4.4 - Solving Multi-Step Inequalities

$5y^2 + 12y^2$

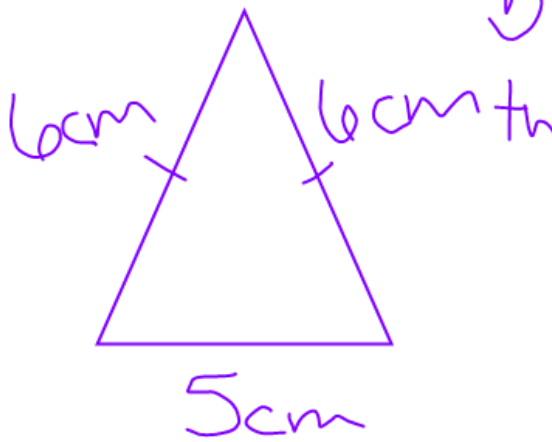
$3(x+4)$

$3x+12$

Vocabulary:

- Distribute
- Like Terms $4y$ & $7y$
- Isosceles Triangle
- Congruent Sides

$\cong$



two sides that are congruent

1 EXAMPLE Solve $5 + 4b < 21$.

$-5 \quad -5$

$\frac{4b}{4} < \frac{16}{4}$

$b < 4$

Solve each inequality.

#1. $4d + 7 \leq 23$

$-7 \quad -7$

$\frac{4d}{4} \leq \frac{16}{4}$

$d \leq 4$

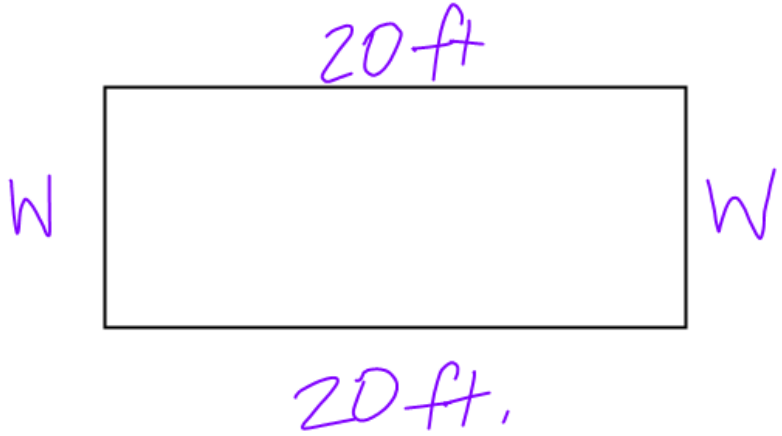
#3. $-4x + 2 < 8$

$+2 \quad +2$

$\frac{-14x}{-4} < \frac{10}{-4}$

$x > -2\frac{1}{2}$

2 EXAMPLE The band is making a rectangular banner that is 20 feet long with trim around the edges. What are the possible widths the banner can be if there is no more than 48 feet of trim?



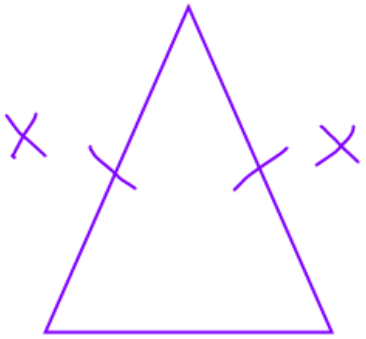
$40 + 2w \leq 48$

$-40 \quad -40$

$\frac{2w}{2} \leq \frac{8}{2}$

$w \leq 4$ ft.

11. The perimeter of an isosceles triangle is at most 27cm. The base is 8cm long. Find the possible lengths of the two congruent sides.



$x + x + 8 \leq 27$

$2x + 8 \leq 27$

$-8 \quad -8$

$\frac{2x}{2} \leq \frac{19}{2}$

$x \leq 9.5\text{cm}$

3 EXAMPLE Solve $3x + 4(6 - x) < 2$.

$3x + 24 - 4x < 2$

$-x + 24 < 2$

$-24 \quad -24$

$\frac{-1x}{-1} < \frac{-22}{-1}$

$x > 22$

#13. $2(j-4) \geq -6$

$2j - 8 \geq -6$

$+8 \quad +8$

$\frac{2j}{2} \geq \frac{2}{2}$

$j \geq 1$

4 EXAMPLE Solve $8z - 6 < 3z + 12$.

$-3z \quad -3z$

$5z - 6 < 12$

$+6 \quad +6$

$\frac{5z}{5} < \frac{18}{5}$

$z < 3.6$

or

$z < 3\frac{3}{5}$

#23. $3t + 7 \geq 5t + 9$

$-3t \qquad -3t$

$7 \geq 2t + 9$

$-9 \qquad -9$

$\frac{-2}{2} \geq \frac{2t}{2}$

$-1 \geq t$

5 EXAMPLE Solve $5(-3 + d) \leq 3(3d - 2)$.

$-15 + 5d \leq 9d - 6$

$-5d \quad\quad -5d$

$-15 \leq 4d - 6$

$+6 \quad\quad +6$

$\frac{-9}{4} \leq \frac{4d}{4}$

$-2\frac{1}{2} \leq d$

#31. $-3(v-3) \geq 5-4v$

$-3v+9 \geq 5-4v$

$+4v \qquad +4v$

$v+9 \geq 5$

$-9 \qquad -9$

$v \geq -4$

Homework: pg. 222 #2, 6, 10, 12, 16, 24, 30, 32, 36, 46, 48, 88