INEQUALITIES

1. Solve and graph each inequality:

a) $3x-1-(2-2x)<2$

b) $2x-8-3(1+2x)>1$

c) $-(5x+6)+2x-1\leq 3(1-4x)+11$

d) $\frac{z}{3}+\frac{z}{2}+15\geq 25$

e) $\frac{x}{3}-2x-6\geq 3-2(x+3)$

f) $\frac{x+2}{4}-3-2x>\frac{1-6x}{3}-\frac{4}{3}$

g) $\frac{y}{6}-\frac{y+2}{4}\geq\frac{1}{3}$

h) $\frac{x}{3}-5x-8<2(2-x)$

2. The dimensions of a rectangular table have been measured with an error less than 1 cm. The result is as follows:

135 cm $\leq$ length $\leq$ 136cm

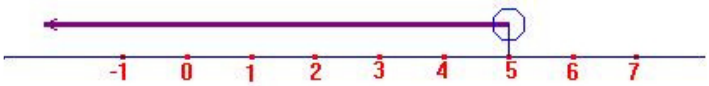
75 cm $\leq$ width $\leq$ 76 cm

Between which numbers will the perimeter be?

SOLUTION

1. Solve and graph each inequality:

a) $3x-1-(2-2x)<2 \rightarrow 3x-1-2+2x<2 \rightarrow x<2+1+2 \rightarrow x<5$



b) $2x-8-3(1+2x)>1 \rightarrow 2x-8-3-6x>1 \rightarrow 2x-6x>1+8+3 \rightarrow -4x>12$

$4x<-12 \rightarrow x<\frac{-12}{4} \rightarrow x<-3$

c) $-(5x+6)+2x-1 \leq 3(1-4x)+11 \rightarrow -5x-6+2x-1 \leq 3-12x+11$

$-5x+2x+12x \leq 3+11+6+1 \rightarrow 9x \leq 21 \rightarrow x \leq \frac{21}{9} \rightarrow x \leq \frac{7}{3}$

d) $\frac{z}{3}+\frac{z}{2}+15 \geq 25 \rightarrow \frac{2z}{6}+\frac{3z}{6}+\frac{90}{6} \geq \frac{150}{6} \rightarrow 5z \geq 60 \rightarrow z \geq 12$

e) $\frac{x}{3}-2x-6 \geq 3-2(x+3) \rightarrow \frac{x}{3}-2x-6 \geq 3-2x-6 \rightarrow \frac{x}{3} \geq 3 \rightarrow x \geq 9$

f) $\frac{x+2}{4}-3-2x>\frac{1-6x}{3}-\frac{4}{3} \rightarrow \frac{3x+6}{12}-\frac{36}{12}-\frac{24x}{12}>\frac{4-24x}{12}-\frac{16}{12}$

$3x+6-36-24x>4-24x-16 \rightarrow 3x>4-16-6+36 \rightarrow 3x>18 \rightarrow x>6$

g) $\frac{y}{6}-\frac{y+2}{4} \geq \frac{1}{3} \rightarrow \frac{2y}{12}-\frac{3y+6}{12} \geq \frac{4}{12} \rightarrow 2y-3y-6 \geq 4 \rightarrow -y \geq 10 \rightarrow y \leq -10$

h) $\frac{x}{3}-5x-8<2(2-x) \rightarrow x-15x-24<6(2-x) \rightarrow x-15x-24<12-6x$

$x-15x+6x<12+24 \rightarrow -8x<36 \rightarrow 8x>-36 \rightarrow x>-\frac{9}{2}$

2. The dimensions of a rectangular table have been measured with an error less than 1 cm. The result is as follows:

$135 \text{ cm} \leq \text{ length } \leq 136\text{cm}$

$75 \text{ cm} \leq \text{ width } \leq 76 \text{ cm}$

Between which numbers will the perimeter be?

Length x $\rightarrow 135 \leq x \leq 136 \rightarrow 270 \leq 2x \leq 272$

Width y $\rightarrow 75 \leq y \leq 76 \rightarrow 150 \leq 2y \leq 152$

Perimeter $2x + 2y \rightarrow 270 + 150 \leq 2x + 2y \leq 272 + 152 \rightarrow 420 \leq P \leq 424$

Answer: The perimeter will be between 420 cm and 424 cm