

- ① target value \pm half tolerance: $42'' \pm 6''$ | ③ min. value $\begin{matrix} +\text{tolerance} & 36'' + 12'' \\ -0 & -0 \end{matrix}$
- ② max. value: $48''$
min. value: $42''$ | ④ max. value - tolerance $\begin{matrix} +0 & 48'' + 0 \\ -12'' & -12'' \end{matrix}$

Example 2

The minimum height for a child's ride at the Red River Ex is 36 inches. The maximum height allowed is 48 inches.

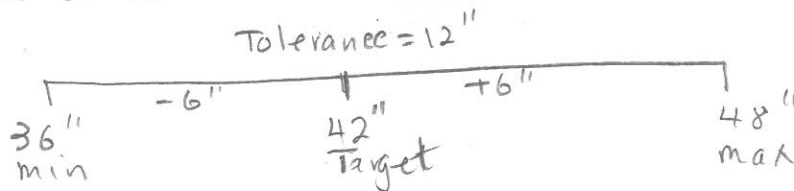
a) State the tolerance of the height requirement for this ride.

$$\text{Tolerance} = \text{max} - \text{min} \\ 12'' = 48'' - 36''$$

b) Write the tolerance for ride height in the four different ways.

a) Tolerance = maximum value - minimum value
Tolerance = $48'' - 36'' = 12''$

$$\text{Target} = \text{max} - \frac{1}{2} \text{tolerance}$$



Example 3

Find the **tolerance**, the **maximum** value, and the **minimum** value for each of the following measurements.

Target $\pm \frac{1}{2}$ tolerance | max: $2.5 + 0.5 = 3$ hrs
min: $2.5 - 0.5 = 2$ hrs | Tolerance: max - min = 6 cm
max: 42 cm
min: 36 cm

a) 2.5 hours \pm 0.5 hours Tolerance: $0.5 \times 2 = 1$ hr | b) 42 cm max
36 cm min

c) 6 feet $\begin{matrix} +0 \text{ feet} \\ -0.5 \text{ feet} \end{matrix}$

max: $6 + 0 = 6$ feet
min: $6 - 0.5 = 5.5$ feet

d) 23 g $\begin{matrix} +2 \text{ g} \\ -0 \text{ g} \end{matrix}$

min $\begin{matrix} +\text{tolerance} \\ -0 \end{matrix}$

max $\begin{matrix} +0 \\ -\text{tolerance} \end{matrix}$

Tolerance: 0.5 feet

max: $23 \text{ g} + 2 \text{ g} = 25 \text{ g}$

min: $23 \text{ g} - 0 \text{ g} = 23 \text{ g}$

Tolerance: max - min = 2 g
 $25 - 23 = 2 \text{ g}$

Example 4

A manufacturing company has determined that the desired length of a part is 8 cm \pm 1.2 cm. The tolerance is given in the form $\text{nominal value} \begin{matrix} +\text{tolerance} \\ -0 \end{matrix}$. State the nominal value and tolerance.

nominal value is the minimum value

Nominal value: minimum value = $6.8 \text{ cm} \leftarrow (8 - 1.2)$

Tolerance: $2.4 \text{ cm} \leftarrow (2 \times 1.2)$

nominal value (minimum) $\begin{matrix} +\text{tolerance} \\ -0 \end{matrix}$

$6.8 \text{ cm} \begin{matrix} + 2.4 \text{ cm} \\ - 0 \text{ cm} \end{matrix}$

