

**Automotive
Tolerance Quiz**

Name Key

1. An engine bore measures 4 inches and has a tolerance of $\pm .0005$ inches. Find the longest and the shortest possible diameter of the bore.

Longest 4.0005 in
Shortest 3.9995 in

$$4 \pm .0005$$

2. A piston measures 3.9375 inches with a tolerance of $\pm .0005$ inches. Find the longest possible length and the shortest possible diameter of the piston.

Longest 3.938 in
Shortest 3.937 in

$$3.9375 \pm .0005$$

3. Find the acceptable range of values for a brake rotor with a thickness of 1.125 inches and a tolerance of $\pm .002$ inches.

$$1.123 \text{ in} \leq T \leq 1.127 \text{ in}$$

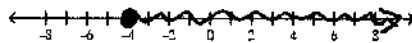
$$\begin{aligned} |T - 1.125| &\leq .002 \\ T - 1.125 &\leq .002 \quad \& \quad T - 1.125 \geq -.002 \\ -.002 &\leq T - 1.125 \leq .002 \\ 1.123 &\leq T \leq 1.127 \end{aligned}$$

4. Find the acceptable range of values for a connecting piston rod with a length of 3.675 inches and a tolerance of $\pm .001$ inches.

$$3.674 \text{ in} \leq L \leq 3.676 \text{ in}$$

$$\begin{aligned} |L - 3.675| &\leq .001 \\ L - 3.675 &\leq .001 \quad \& \quad L - 3.675 \geq -.001 \\ -.001 &\leq L - 3.675 \leq .001 \\ 3.674 &\leq L \leq 3.676 \end{aligned}$$

5. Solve and graph $-2x + 7 \leq 15$
- $$\begin{array}{r} -2x + 7 \leq 15 \\ -7 \quad -7 \\ \hline -2x \leq 8 \\ -2 \quad -2 \\ \hline x \geq -4 \end{array} \quad \begin{array}{l} \div \text{ by } -2 \\ \text{flip sign} \end{array}$$

$$x \geq -4$$


6. Solve and graph $4x + 5 \geq 17$ and $3x - 7 \leq 17$
- $$\begin{array}{r} 4x + 5 \geq 17 \\ -5 \quad -5 \\ \hline 4x \geq 12 \\ \frac{4}{4} \quad \frac{12}{4} \\ \hline x \geq 3 \end{array} \quad \begin{array}{r} 3x - 7 \leq 17 \\ +7 \quad +7 \\ \hline 3x \leq 24 \\ \frac{3}{3} \quad \frac{24}{3} \\ \hline x \leq 8 \end{array}$$

$$x \geq 3 \quad \& \quad x \leq 8$$
