

3.4 Tolerance Practice

1. Complete the following table

Tolerances				
Nominal Value	Minimum Value	Maximum Value	Tolerance	$\pm \frac{1}{2}$ of T
115 mm			6 mm	
	12.5 cm	17.5 cm		
	85°F		10°F	
$3\frac{3}{4}$ "				$\frac{1}{8}$ "

1. Munira is making custom kitchen cabinets. The front face of a drawer must have a width between $17\frac{15}{16}$ " and $18\frac{1}{16}$ " and a height between $6\frac{15}{16}$ " and $7\frac{1}{16}$ ".
 - a. What are the nominal dimensions of the drawer face.
 - b. What is the tolerance in the measurements?
 - c. Write the width and height in the form: nominal value $\pm \frac{1}{2}$ (tolerance).

2. A chemical mixture in a manufacturing process needs to reach a nominal temperature of 10.0°C , with a tolerance of 0.5°C .

a. What are the minimum and maximum acceptable temperatures? Write them in the form $\frac{\text{maximum value}}{\text{minimum value}}$

b. Write the temperature in the form: nominal value $\pm \frac{1}{2}$ (tolerance).

3. Marietta is building a chair. Each chair leg is attached to the chair seat by a peg that fits into a hole in the seat. The nominal diameter of the peg is 1.2 cm with a tolerance of 0.04 cm.

a. Write the diameter of the peg in the form: $\frac{\text{maximum value}}{\text{minimum value}}$.

b. Explain why there is a tolerance for the diameter of the peg?

4. A part being manufactured in a machine shop has a maximum allowable dimension of 16.28 mm and a minimum of 16.16 mm.
- What is the manufacturing tolerance?

- Write the dimension in the form: nominal value $\pm \frac{1}{2}$ (tolerance)

- Write the dimension in the form: $\begin{matrix} \text{maximum value} \\ \text{minimum value} \end{matrix}$

5. A machinery part has a nominal value of 8.9 cm and a tolerance of 0.005 cm.
- Calculate the maximum and minimum acceptable values.

- Write the dimension in the form: minimum value $\begin{matrix} +\text{tolerance} \\ -0 \end{matrix}$

- Write the dimension in the form: maximum value $\begin{matrix} -t \\ +0 \end{matrix}$

6. An electrical resistor has resistance with a nominal value of 100 Ohms and a tolerance of 3%.

a. What is the range of acceptable values, in Ohms, for the resistor?

b. Write the resistance in the form: nominal value $\pm \frac{1}{2}$ (tolerance)

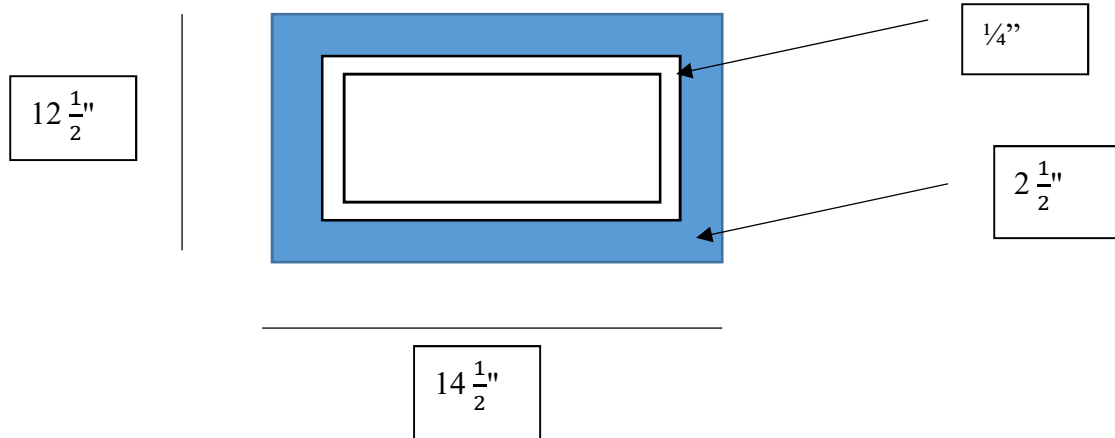
7. Junichi is tiling a roof. The building code specifies that roof tile may have an overhang of a maximum of 64 mm and a minimum of 35 mm.

a. Calculate the nominal overhang for a roof tile.

b. Express the tolerance in four different ways.

Challenge!

8. Darius is cutting glass that will be inserted into the picture frame shown below. The picture frame is $12\frac{1}{2}$ " wide and $14\frac{1}{2}$ " long. It has a $2\frac{1}{2}$ " border that will be visible around the picture inserted into the frame. The glass will sit inside a $\frac{1}{4}$ " groove(lip).



- What are the piece of glass's maximum and minimum dimensions, and their tolerances?
- Would it be better to make the glass larger or smaller? How could you write the tolerance of the glass to show this?