Process-to-Process Equations:

Inches (in) to millimeters (mm) = in x 25.4

Millimeters (mm) to inches (in) = mm/25.4

$Volume = \pi \times R^2$

Utilization Equations:

Machine Utilization = Machine Time Used/Machine Time Available

Machine Efficiency = Actual Shots Produced/Expected Shots Produced

Part Quote:

$$\text{Annual Machine Hours} = \frac{(Annual\ Volume + Annual\ Scrap\ Volume)\ x\ Cycle\ Time}{3600}$$

$$\text{Annual Machine Cost} = Annual\ Machine\ Hours\ x\ Machine\ Rate$$

$$\text{Annual Labor Cost} = Annual\ Machine\ Hours\ x\ \%Labor\ x\ Labor\ Rate$$

$$\text{Annual Material Cost} = (Annual\ Volume + Annual\ Scrap)\ x\ \frac{Shot\ Weight}{454} * Material\ Cost$$

$$\text{Price Per 1000} = \frac{(Annual\ Machine\ Cost + Annual\ Labor\ Cost + Annual\ Material\ Cost + Annual\ Setup\ Cost)\ x\ (1 + Expected\ Margin)}{1000}$$

$$\text{Expected Annual Profit} = \frac{Annual\ Machine\ Cost + Annual\ Labor\ Cost + Annual\ Material\ Cost + Annual\ Setup\ Costs}{Expected\ Margin}$$

Expected Parts per Shift

Try this one on your own

Process Capability

Average = Use the Microsoft “Average” function

Standard Deviation = Use the Microsoft “StdDev.P” function

$$\text{Pp} = \frac{(Max\ Tolerance - Min\ Tolerance)}{(6\ x\ Standard\ Deviation)}$$

$$\text{Ppk Min} = \frac{(Average - Min\ Tolerance)}{(3\ x\ Standard\ Deviation)}$$

$$\text{Ppk Max} = \frac{(Max\ Tolerance - Average)}{(3\ x\ Standard\ Deviation)}$$