### Turning Formulas

**Feed Rate:**
The rate of insert travel through the workpiece measured in inches per minute.

\[
\text{Feed Rate} = \text{Feed} \times \text{RPM} \\
\text{(inches per minute)} \times \text{(inches per revolution)}
\]

**Cutting Speed:**
The velocity of the workpiece as it passes the insert measured in surface feet per minute.

\[
\text{Cutting Speed} = \text{Workpiece Diameter} \times 0.262 \times \text{RPM} \\
\text{(SFM)}
\]

**Revolutions Per Minute:**
The rotating velocity of the machine spindle.

\[
\text{RPM} = \frac{\text{Cutting Speed} \times \text{Workpiece Diameter} \times 3.82}{\text{SFM}}
\]

**Metal Removal Rate:**
The speed, measured in cubic inches per minute, that stock is removed from the part being machined.

\[
\text{MRR} = \text{Depth of Cut} \times \text{Feed} \times \text{Cutting Speed} \times 12
\]

### Milling Formulas

**Feed Rate:**
The rate of insert travel through the workpiece measured in inches per minute.

\[
\text{Feed Rate} = \frac{\text{Chip load} \times \text{Number of teeth} \times \text{RPM}}{\text{(inches per minute)}}
\]

**Cutting Speed:**
The velocity of the workpiece as it passes the insert measured in surface feet per minute.

\[
\text{Cutting Speed} = \frac{\text{Cutter Diameter} \times \text{RPM} \times 3.1416}{12}
\]

**Revolutions Per Minute:**
The rotating velocity of the machine spindle.

\[
\text{RPM} = \frac{\text{Cutting Speed} \times 12}{\text{Cutter Diameter} \times 3.1416}
\]

**Metal Removal Rate:**
The speed, measured in cubic inches per minute, that stock is removed from the part being machined.

\[
\text{MRR} = \text{Depth of Cut} \times \text{Width of Cut} \times \text{Feed}
\]

**Chip Load:**
Inches Per Tooth

\[
\text{Chip Load} = \frac{\text{Feed Rate}}{\text{Number of Teeth} \times \text{RPM}}
\]