

# Advanced Machining Processes

## Quiz 6

Name: \_\_\_\_\_ **Solution** \_\_\_\_\_

1. In turning and boring:

- a) **Briefly**, describe in words or with a sketch the trajectory of the feed grooves that dictate surface finish.
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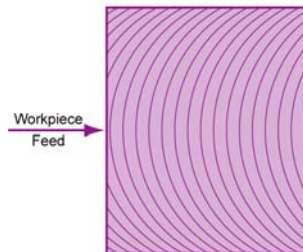
The feed grooves in turning and boring wrap helically around the axisymmetric surface, on the OD for turning and on the ID for boring.

- b) From a surface finish standpoint, does the direction of the trace make a difference on any of the four parameters? If so, which one(s).
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Yes, it makes a difference on all four surface-finish parameters:  $r_{cl}$ ,  $R_t$ ,  $R_a$ ,  $R_q$ .

2. In face milling:

- a) **Briefly**, describe in words or with a sketch the trajectory of the feed grooves that dictate surface finish.
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- b) From a surface finish standpoint, does the direction of the trace make a difference on any of the four parameters? If so, which one(s).
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Yes, it makes a difference on all four surface-finish parameters:  $r_{cl}$ ,  $R_t$ ,  $R_a$ ,  $R_q$ .

3. Regarding tool flank wear:

- a) What three primary wear mechanisms exist in machining?
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Abrasion

Adhesion

Dissolution

**Continued on back**

## Quiz 6

b) Flank wear behaves, as a function of tool engagement time, as what type of function?

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Third-order Polynomial

4. Regarding tool life:

a) Though it depends on a number of process conditions, what is the primary condition of interest that shows up in Taylor's tool life model?

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Cutting Speed,  $V$

b) **Briefly**, describe what dictates when a tool's life is complete.

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When the machined surface is no longer satisfactory, as indicated by roughness, residual stresses or form error (due to increased forces). This is hopefully the constraint that activates prior to the constraint of catastrophic tool failure (fracture or softening) due to weakened edge.

5. In the time-cost-profit model presented in lecture, how is engagement time related to machining time?

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Through the constant  $k$ , which is less than or equal to one.