Answers to Exercises

If you are attending a class that uses this text, your instructor may ask you not to look at these answers prior to submitting your work. (Each exercise can be removed from this text without removing any content.) On the other hand, if you are reading this text on your own, you can use these answers to check your work.

Exercise 1: Machine configurations

1) true

2) true

3) false

4) a. The X axis is the left/right direction (as viewed from the front of the machine)
b. The Y axis is the in/out direction (as viewed from the front of the machine)
c. The Z axis is the up/down direction (as viewed from the front of the machine)
d. If the machine has a rotary table on the table, it could be called the A, B, or C axis, depending upon orientation

5) a. As viewed from the spindle, left/right motion is the X axis.
b. As viewed from the spindle, up/down motion is the Y axis.
c. As viewed from the spindle, in/out motion is the Z axis.
d. If the machine has a rotary axis mounted in the table, it is called the B axis.

6) a. As viewed from the front, tool motion toward the right
b. Tool motion away from the operator
c. Tool motion in an upward direction

7) Answers include speed, direction and possibly range

8) d. in feed per minute

9) c. S word

10) b. F word

Extension question answers:

11) All roughing should be done before any finishing is done.

12) When the machine is rigid enough to withstand the tendency for the tool to pull into the cut. Most machinists agree that climb milling will render a better finish than conventional milling, but should not be done with knee style machines.

13) Because with most machines, the tool does not actually move along with one or more of the axes. To try to consider table motion plus versus minus can be quite confusing.

Exercise 2: Visualizing program execution

1) The person performing the operation manually has everything in front of them and available. The person preparing the CNC program must do so with only print, pen, and paper.

2) true

3) true

4) true

5) false

6) true

7) false

8) a. X0.0007

9) A modal word will set a state the remains in effect until changed or canceled.

10) An initialized word will be automatically instated when the machine power is turned on.

Extension question answers:

11) In order to write CNC programs, a programmer must be able to visualize machining operations as the program is