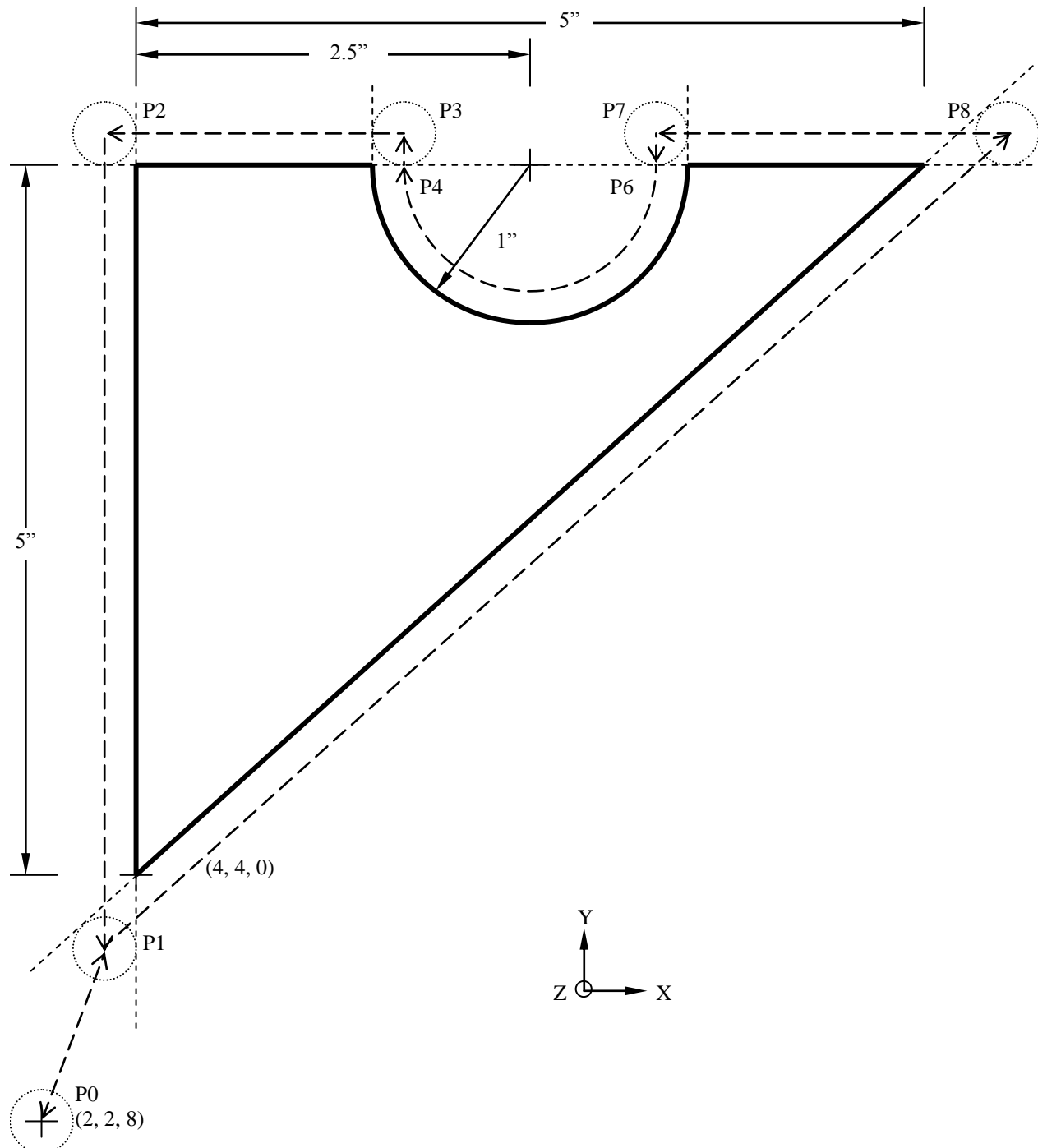


**HW 02: APT PROGRAMMING**

NAME: \_\_\_\_\_

The following workpiece is to have a finishing pass around its periphery (see NC Programming Notes, Figure 1).



**Figure 1. Workpiece for APT machining.**

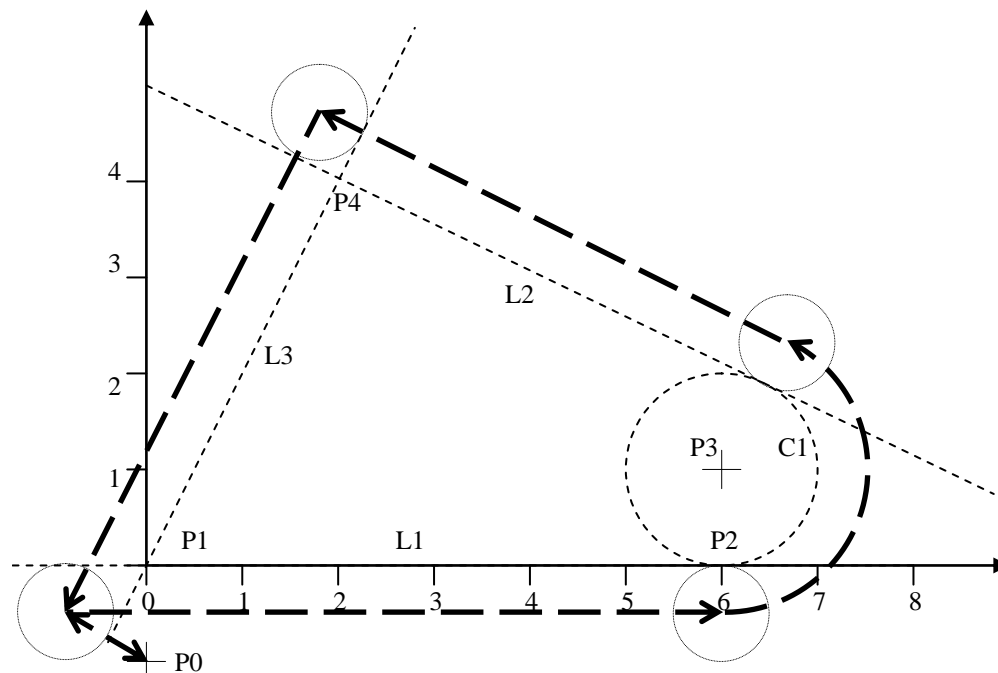
*(HW questions are on the reverse side of this page.)*

### Questions:

1. Set up and create an APT program that profiles the part in Figure 1 in a counter-clockwise direction: (a) using full circle interpolation (i.e. use the points indicated, above); and (b) utilizes a coolant to flush chips from the surfaces. *Hint: NONE of the points (P0 – P8) are needed from the NC part in HW 01 ... and neither are the moves from P7 – P6 or from P4 – P3.*

The pertinent machining data is: (a) cutter diameter is 0.25 inches; (b) feed rate is 6 inches per minute; (c) cutting speed is 300 surface feet per minute; (d) the tool home position is at (2, 2, 8); and (e) the part home position is at (4, 4, 0), referencing the **lower**, left corner of the top of the workpiece. (Adapted from Chang, T. C., Wysk, R. A., & Wang, H. P. (1991). *Computer-Aided Manufacturing*. Englewood Cliffs, NJ: Prentice-Hall. pp. 253-255.)

*Hint: You can save yourself a lot of geometry if you look at the calculations on the NC Programming Handout*



### Figure 2. APT Geometry and Tool Path for Workpiece

2. An APT program for the profiling of the part in Figure 2 (see the APT Programming Notes) is to be generated. (See the APT Programming Notes) The processing parameters are: (a) feed rate is 5.39 inches per minute; (b) spindle speed is 573 revolutions per minute; (c) a coolant is to be used to flush the chips; (d) the cutter diameter is to be 0.5 inches, (e) depth of cut is 1 inch relative to the top of the part (at Z=0), and (f) the tool home position is (0, -1, 0). (Adapted from Groover, M. P. (1980). *Automation, Production Systems, and Computer-Aided Manufacturing*. Englewood Cliffs, NJ: Prentice-Hall. pp. 253-255.)

*Hint: You can save yourself a lot of work if you look at the program on the APT Programming Handout*

3. Assuming that you had to write the programs from scratch, which programming method would be easiest to use to create the part in Question 1 (NC or APT programming)?

***Attach your work on EP Paper to this sheet and submit by the due date.***