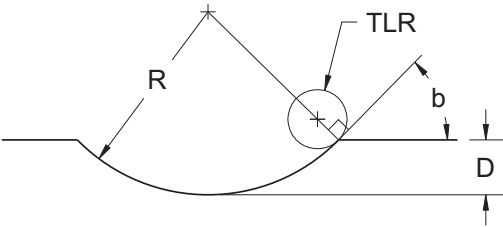
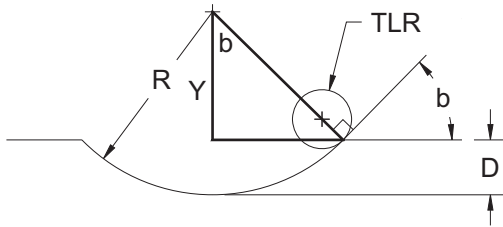


## Clearance Angle Calculation

To calculate the back clearance angle  $b$ , first draw a line from the radius center to the intersection of the diameter and the recess radius. Then, make a perpendicular line at the intersection. The angle between the part diameter and the new line is the angle  $b$ . In order to select a proper cutting tool, the  $b$  angle must be *smaller* than the back angle of the cutting tool. The formula to calculate the angle  $b$  is the same for both examples:

DATA PROVIDED	DATA CALCULATED
 <p> <math>R</math> = SPECIFIED DRAWING RADIUS  <math>b</math> = CLEARANCE ANGLE REQ'D  <math>D</math> = DEPTH OF RECESS    <math>TLR</math> = Tool Nose Radius            (for reference only)         </p>	 <p> <math>Y = R - D</math>  <math>b = \cos^{-1}(Y / R)</math> </p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">34-11a - Solution:</div> <p> <math>Y = 0.375 - 0.015 = 0.36</math>  <math>b = \cos^{-1}(0.36 / 0.375) = 16.26^\circ</math> </p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">34-11b - Solution:</div> <p> <math>Y = 0.1252 - 0.057 = 0.0682</math>  <math>b = \cos^{-1}(0.0682 / 0.1252) = 56.99^\circ</math> </p>

As you see from the results, for the 34-11a example, a  $55^\circ$  or  $35^\circ$  cutting tool can be used, but program for 34-11b example will require a totally different solution, perhaps a special tool or even two tools.