CNC Machining - Trigonometry Practice Problems

Problem 1:

A CNC milling cutter moves diagonally at an angle of 35° relative to the X-axis. If the cutter travels a horizontal distance (X-axis) of 8 inches, what is the total distance traveled along its path?

Problem 2:

A drill bit needs to enter a workpiece at a 20° angle. If the drill needs to reach a depth of 2 inches vertically, how far horizontally must the drill start from the target point?

Problem 3:

A chamfer operation on a CNC lathe cuts at a 45° angle. If the chamfer must be 0.250 inches along both axes equally, what is the total length of the chamfer surface?

Problem 4:

A cutting tool moves from a known position horizontally 10 inches and vertically 4 inches on a CNC mill. What angle does this toolpath form relative to the X-axis?

Problem 5:

During a taper turning operation on a CNC lathe, the tool moves along a path forming an angle of 12° with the workpiece axis. If the tool moves 5 inches along the axis (Z-axis), how much does the tool move inward towards the center (X-axis)?