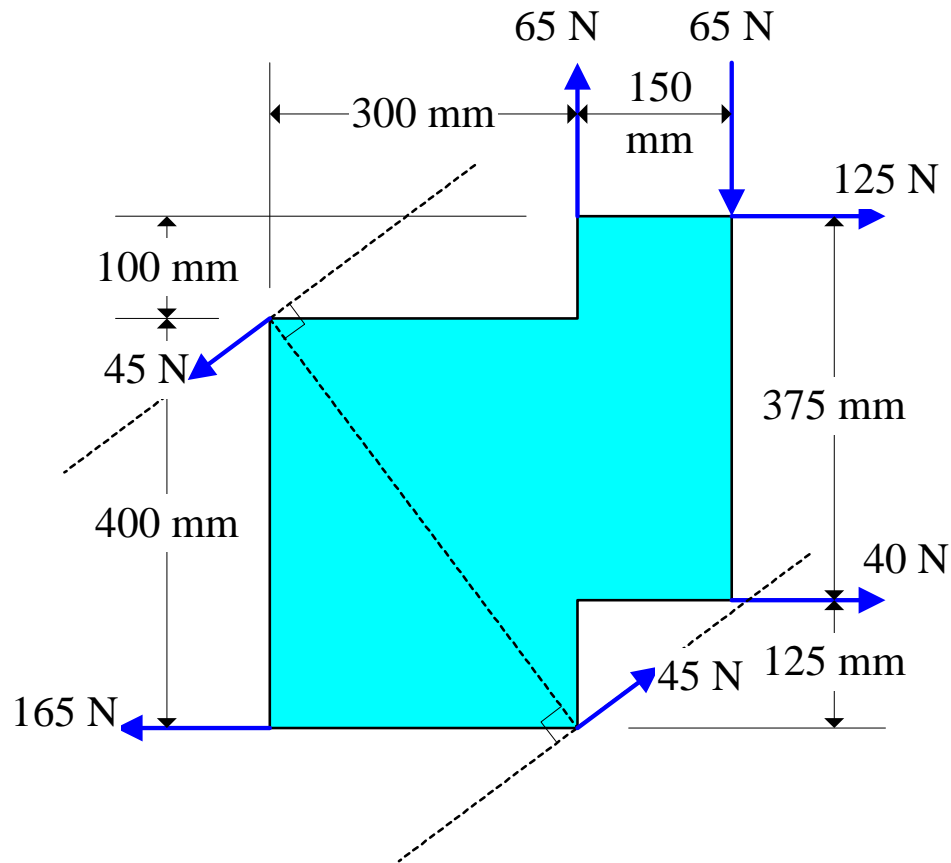# Example 3.3

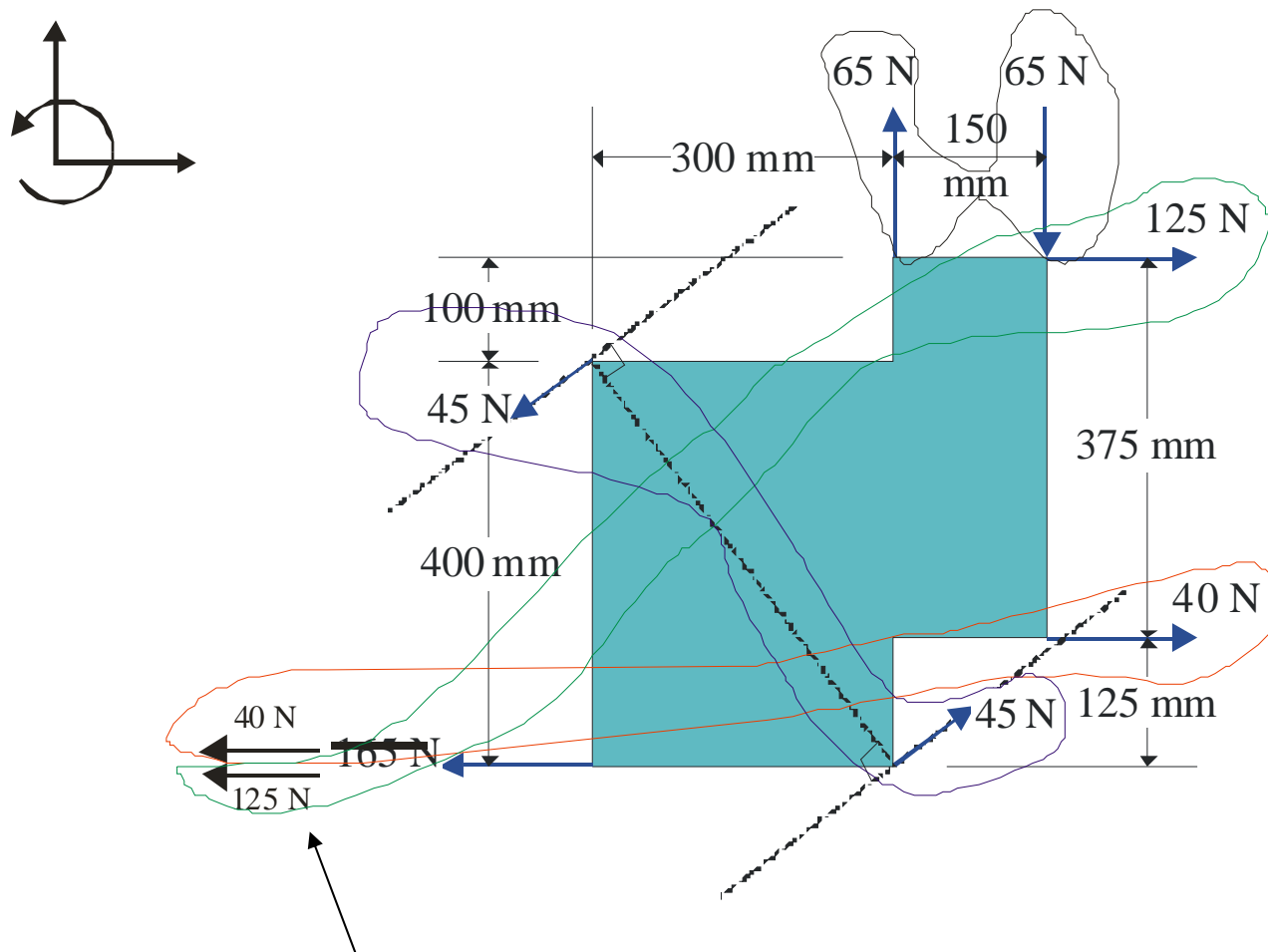## J. Frye

Example 3.3:

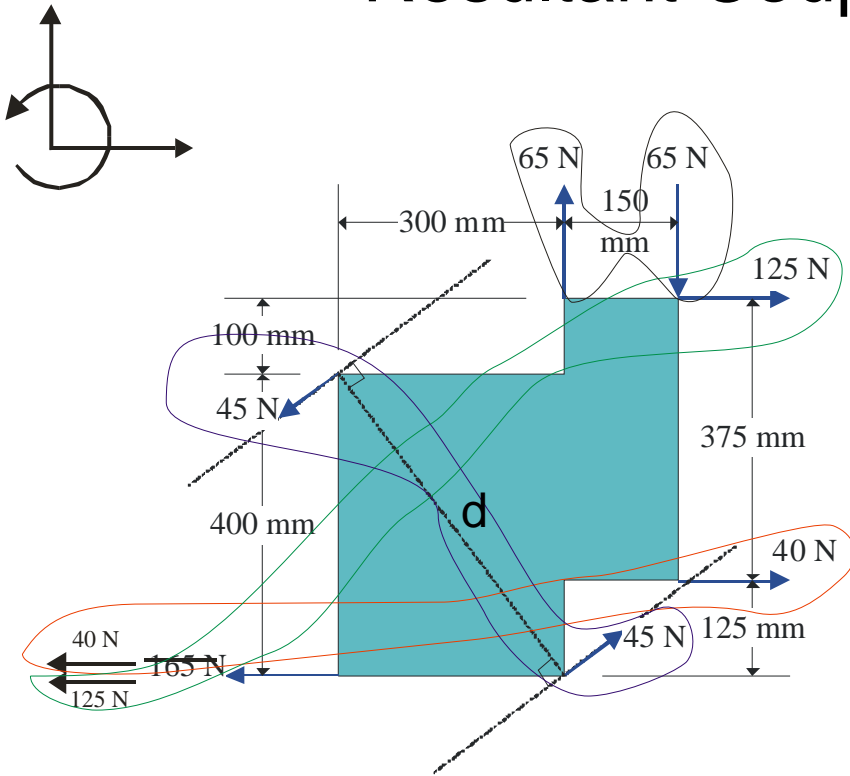Determine the magnitude and the direction of the resultant couple which acts on the system shown.

We break the 165 N force applied at the bottom left corner of the block into a 125 N and 40 N force and identify four (4) couples applied to the block.

65 N   65 N

150 mm

300 mm

125 N

100 mm

45 N

375 mm

400 mm

40 N

40 N

165 N

125 N

45 N   125 mm

165 N force applied as a 40 N + 125 N forces

Resultant Couple Moment, $\mathbf{M_R}$

65 N 65 N

150 mm

300 mm

125 N

100 mm

45 N

375 mm

400 mm

d

40 N

45 N 125 mm

40 N

165 N

125 N

$$d = \sqrt{0.4^2 + 0.3^2} = 0.5$$

$$M_R = -40(0.125) - 125(0.5) + 45(0.5) - 65(0.15)$$

$$= -54.75 \, N.m$$

$$\mathbf{M_R} = 54.75 \, N.m$$