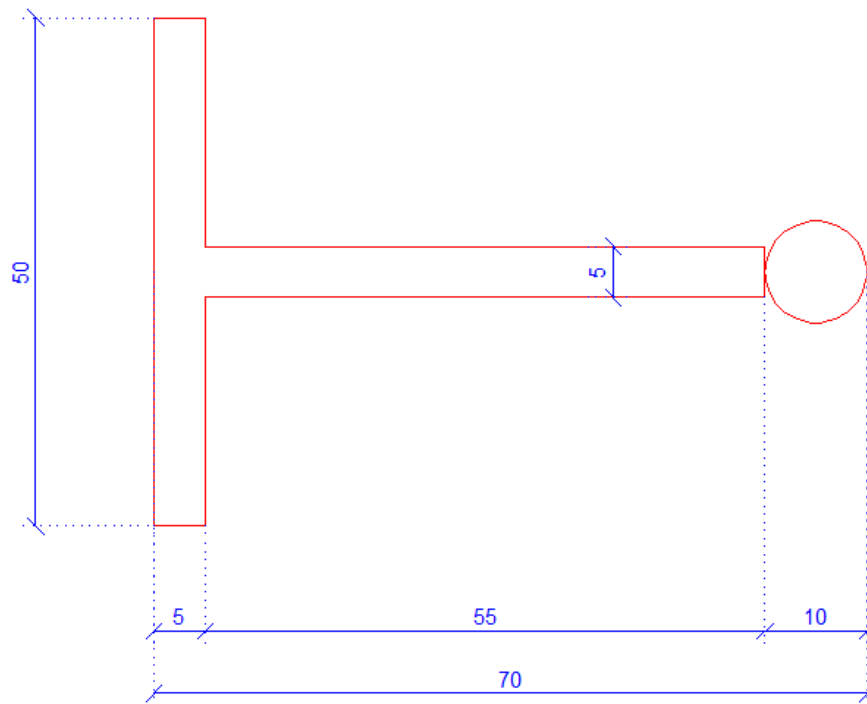# Problem 4

Determine the location of centroid of the given area

SOL.
1- Assume x and y axis
2- Divide the area to three areas with simple shape

3- Find area properties

$A_1 = 50x5 = 250 cm^2$

$A_2 = 5x55 = 275\ cm^2$

$A_3 = \frac{\pi x 10^2}{4} = 78.540\ cm^2$

$A_t = 250 + 275 + 78.54 = 603.54\ cm^2$

$x_1 = 0\ cm$

$x_2 = \frac{5}{2} + \frac{55}{2} = 30 cm$

$x_3 = \frac{5}{2} + 55 + \frac{10}{2} = 62.5 cm$

From symmetry of the shape about x axis $\Rightarrow \bar{y} = 0$

$\bar{x} = \frac{\sum A_i x_i}{\sum A_i} = \frac{250x0 + 275x30 + 78.54x62.5}{603.54} = 21.803\ cm$