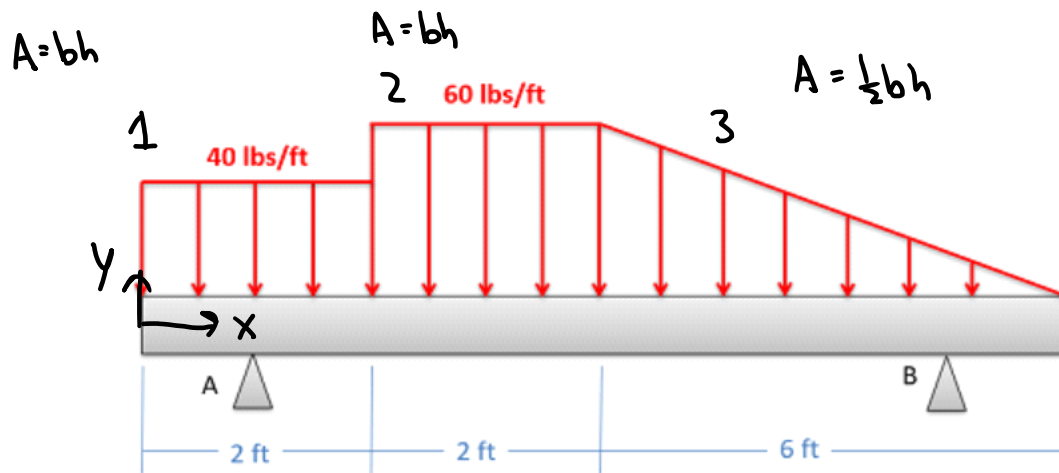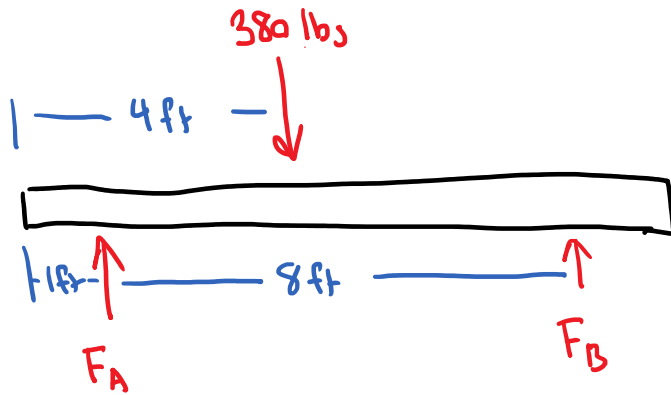# Problem 2

Use composite parts to identify the magnitude and location of the equivalent point load, then use that to identify the reaction forces at supports A and B, which are each 1 ft from the edge of the beam.

Shape	Area (lbs)	$\bar{x}$ (ft)	
1	80	1	$\leftarrow \frac{2}{2}$
2	120	3	$\leftarrow 2 + \frac{2}{2}$
3	180	6	$4 + \frac{6}{3}$

$$F_{eq} = 80 + 120 + 180 = \underline{380 \text{ lbs}}$$

$$X_{eq} = \frac{(80)(1) + (120)(3) + (180)(6)}{380} = 4 \text{ ft}$$

$$\Sigma F_y = F_A + F_B - 380 = 0$$

$$\Sigma M_A = -(380)(3) + (F_B)(8) = 0$$

$$F_B = \frac{(380)(3)}{8} = 142.5 \text{ lbs}$$

$$F_A = 380 - 142.5 = 237.5 \text{ lbs}$$

$$F_A = 237.5 \text{ lbs} \qquad F_B = 142.5 \text{ lbs}$$