Problem 4.1

Determine if the two setups below are statically equivalent.

60 lbs

40 lbs

3 ft — 5 ft — 5 ft

100 lbs

2 ft — 8 ft
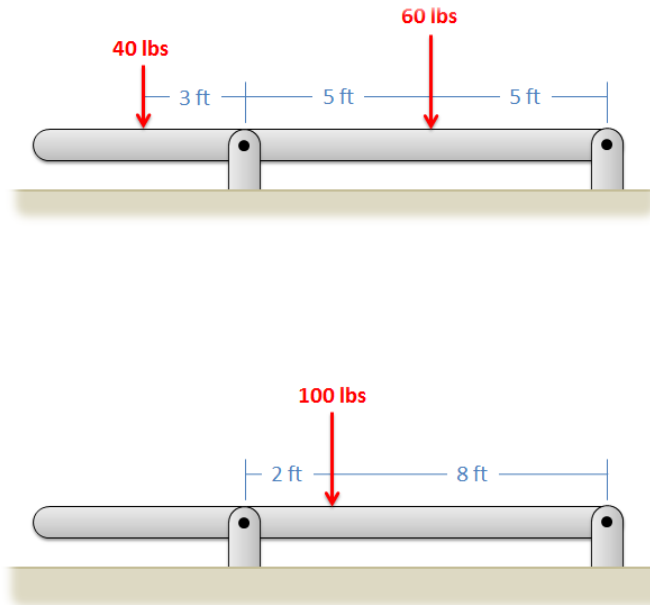
Solution: No, they are not equivalent.

Problem 4.2
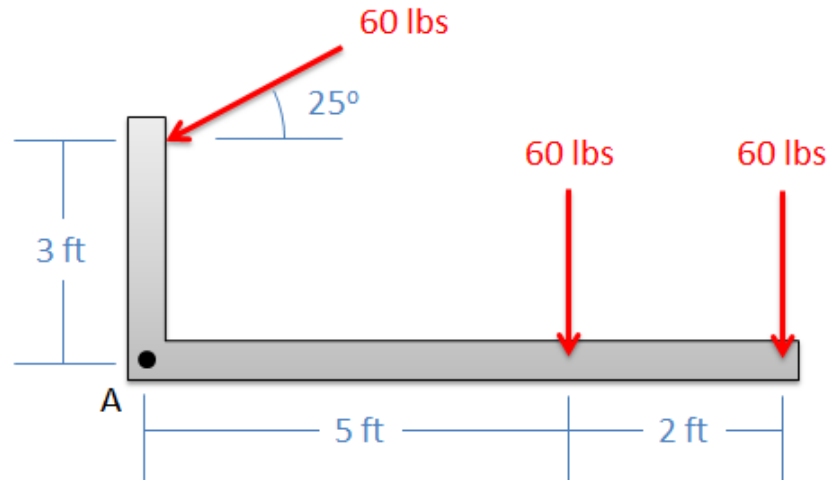
Resolve the force shown below into a force and a couple acting at point A. Draw this force and couple on a diagram of the L shaped beam.

F = 150 N

3 m

5m

A
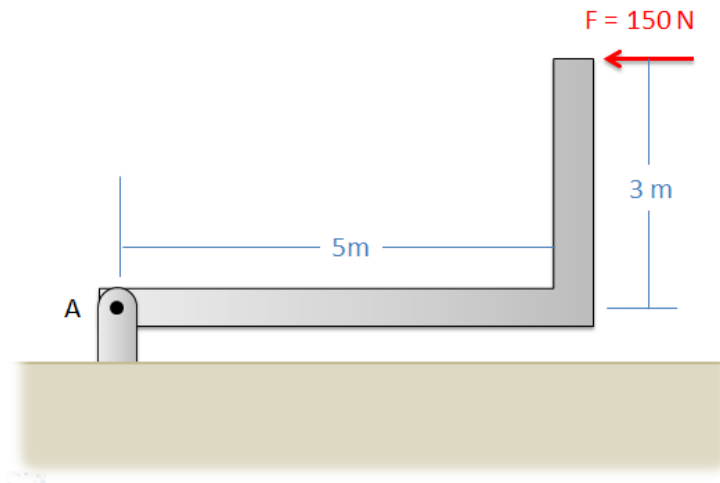
Solution: F_A = 150 N to the left, M_A = 450 Nm

Problem 4.3

Find the equivalent force couple system acting at A for the setup shown below. Draw this force and couple on a diagram of the L shaped beam.

Solution: F_A = 155.2 lbs 69.5° below the negative x axis, M_A = -556.9 ft lbs
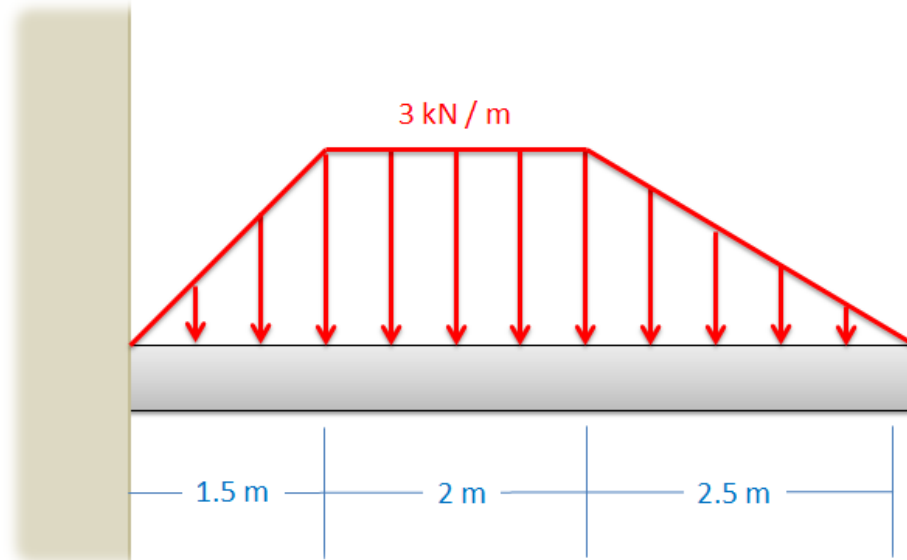
Problem 4.4

Determine the equivalent point load (magnitude and location) for the distributed force shown below using integration.
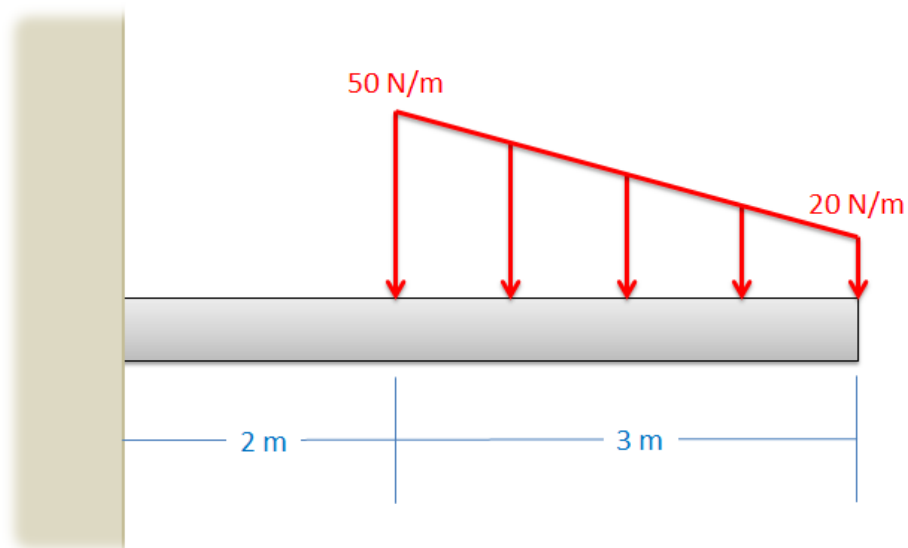
Solution: F_{eq} = 105 N, x_{eq} = 3.29 m

Problem 4.5

Use the method of composite parts to determine the magnitude and location of the equivalent point load for the distributed force shown below.

3 kN / m

1.5 m   2 m   2.5 m

Solution: F_{eq} = 12 kN, x_{eq} = 2.79 m