Unit 4 Sample Homework 3

1. Weights are placed on a very light ruler, and balanced by your two fingers (shown as the two circles).

W1

W2

A

B

200 mm

500 mm

300 mm

(i) If W1 = 2 N and W2 = 20 N determine the forces your fingers at A and B need exert to balance the ruler. Draw an FBD and impose equilibrium conditions: summation of forces and summation of moments about some point. **Do this for all problems!**

(ii) If W2 were kept at 20 N, how large could W1 be made and still be able to balance with your fingers in these exact positions?

(ii) If W2 were kept at 20 N, and say W1 = 50 N. How could you reposition your fingers to keep the ruler in equilibrium. Keep the fingers at the right end and at 300 mm from the left end. What forces would they then exert?

2. A uniform acrylic plate weighs 20 N. It is supported with aluminum rods as shown.

200 mm

140 mm

190 mm

100 mm

80 mm

A

B

C

Determine the forces exerted by the rods A, B, and C.