

Page 31.

7. Perform the following operations on the force vectors below:

$$\mathbf{a} = (25.0, 30.0) \quad \mathbf{b} = (10.00, 12.00) \quad \mathbf{c} = (4.53, -1.560)$$

$$\mathbf{d} = (-1.250, -5.00) \quad \mathbf{e} = (5.60, -2.00) \quad \mathbf{f} = (0.00, 10.00)$$

(a) $\mathbf{a} + \mathbf{b} + \mathbf{c}$

(b) $3\mathbf{c} + \mathbf{d}$

(c) $\mathbf{f} - \mathbf{b} + \mathbf{d}$

(d) $\mathbf{c} + 2\mathbf{d} - \mathbf{f}$

(e) $\frac{1}{2}\mathbf{c} + \mathbf{e}$

(f) $\frac{1}{4}(\mathbf{a} + \mathbf{b})$

(g) $\mathbf{d} - \mathbf{b} + \mathbf{f}$

(h) $-(\mathbf{b} - \mathbf{a})$

2. Calculate the **scalar** of the moments of force about axes through A in the following figure (3.15):

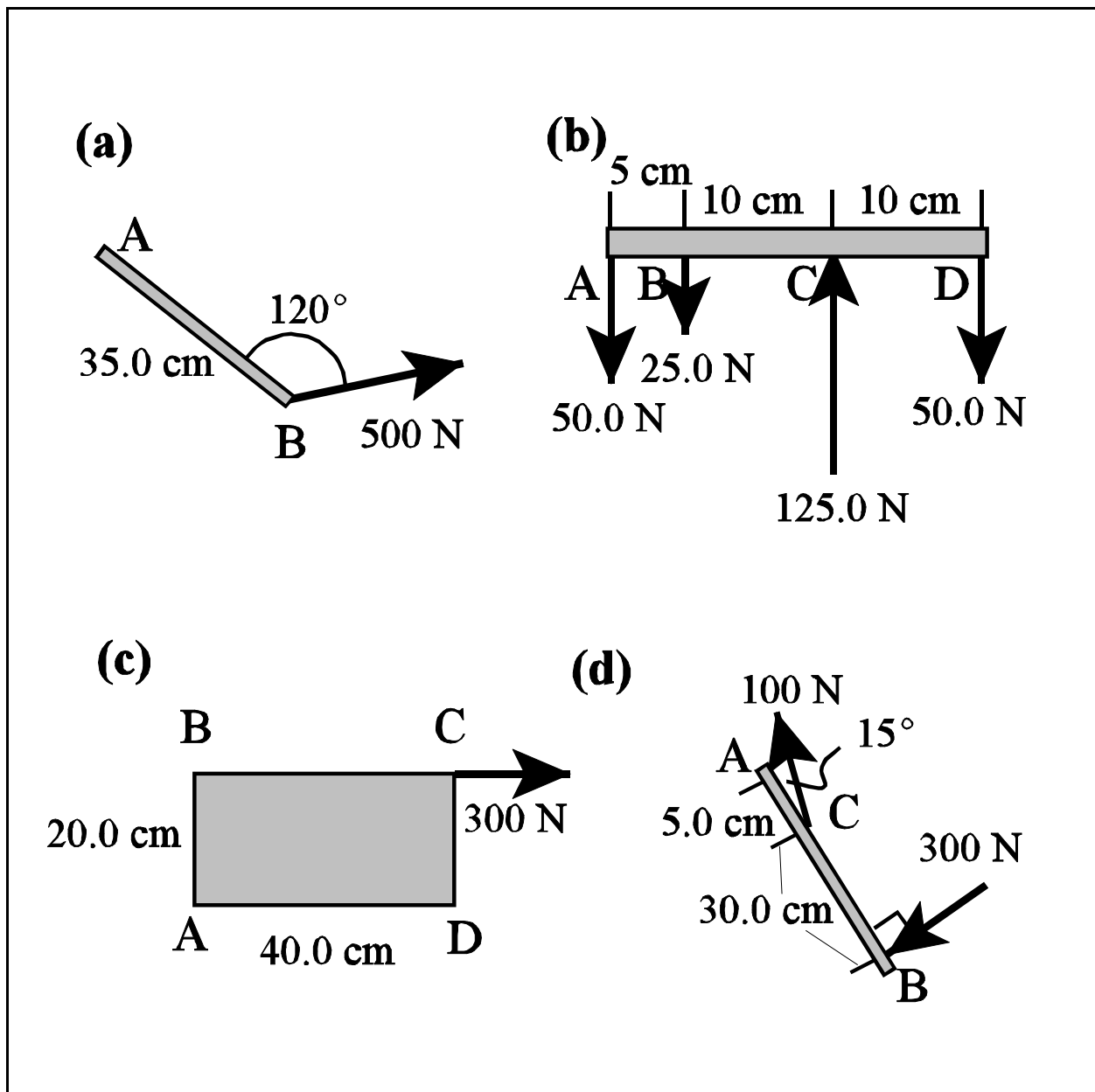


Figure 3.15

5. Jill, who weighs 250 N, sits 2.20 m from the seesaw axis. Cathy, who weighs 200 N, sits 2.50 m from the axis on the other side of the seesaw.

- (a) Which way (up or down) will Cathy move?
- (b) Where must Jill move to balance the seesaw?
- (c) If a third child, Ian who weighs 150 N sits on the seesaw, where must he sit to balance Jill and Cathy in their original positions?

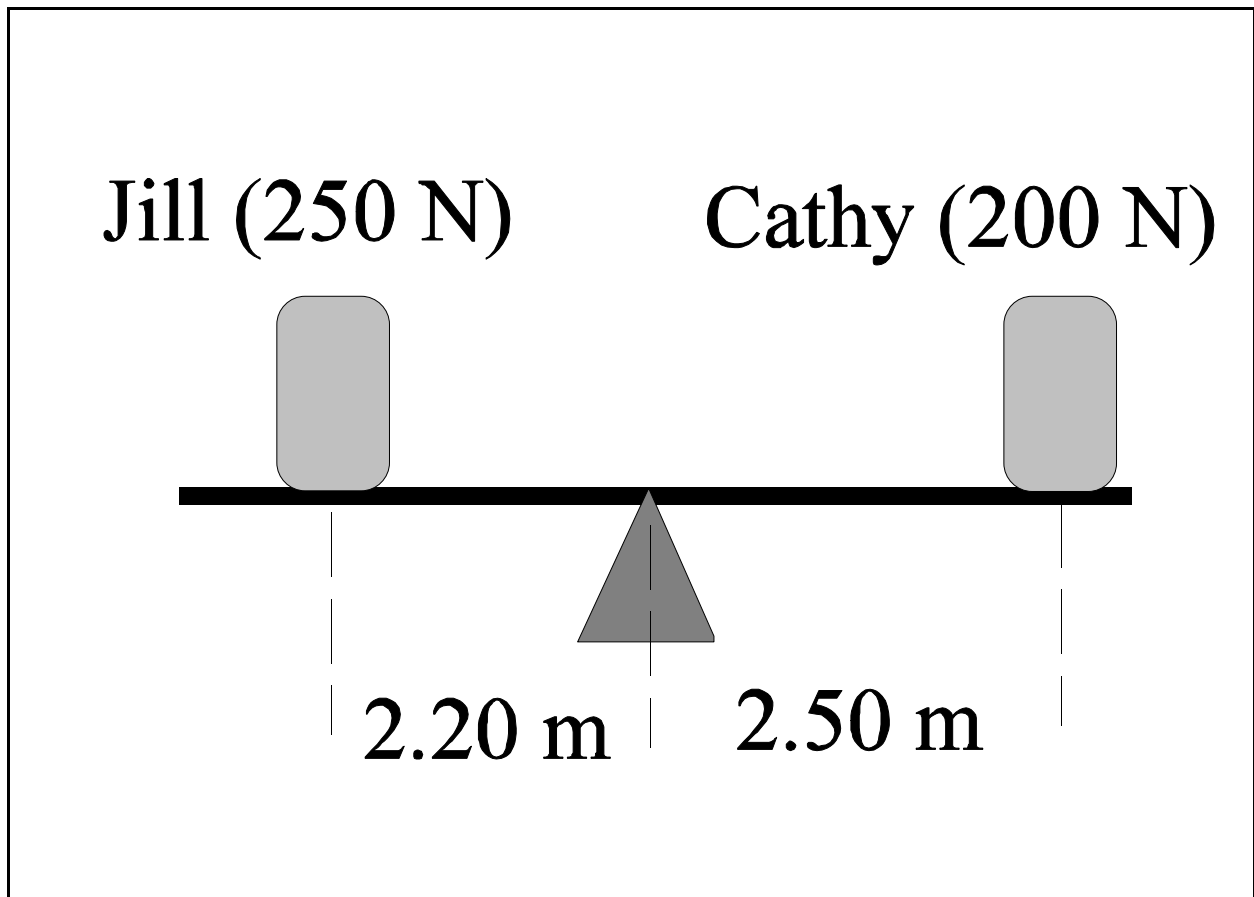


Figure 3.16

7. What are the **moments of force** created by the forces depicted in figure 3.17 about axes through point A.

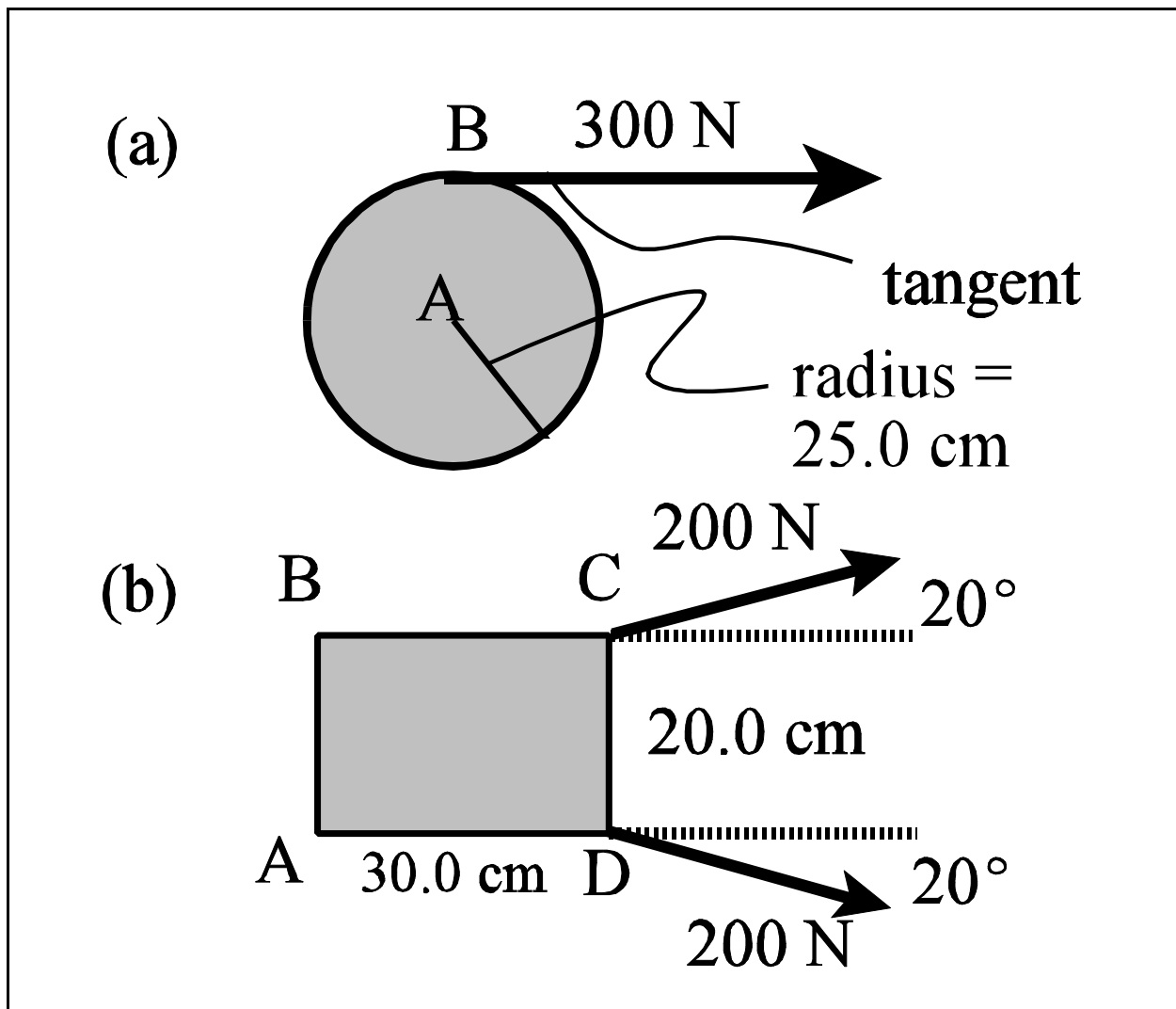


Figure 3.17