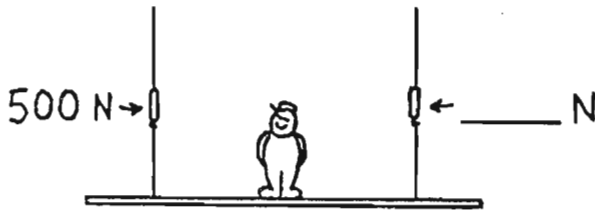
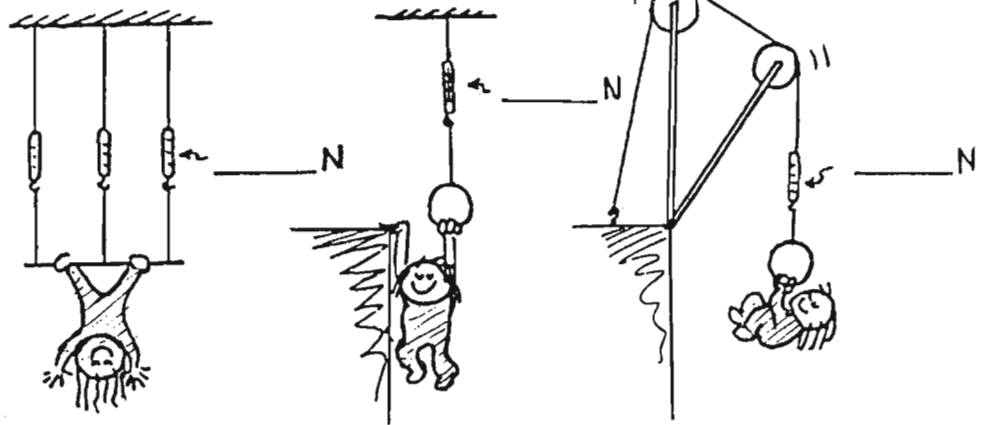
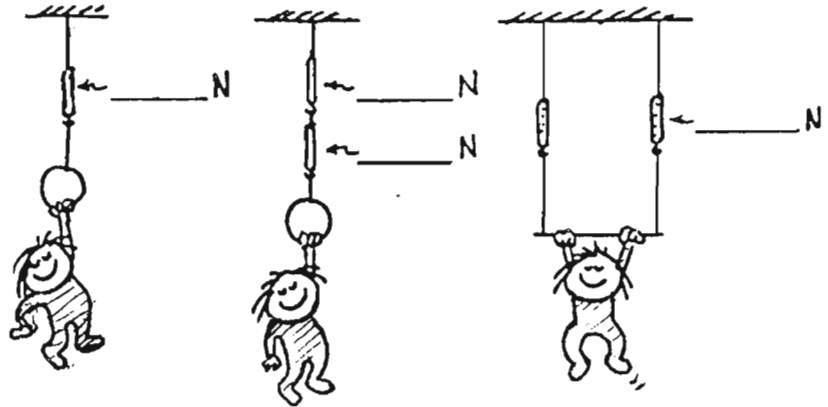


**Concept-Development
Practice Page**

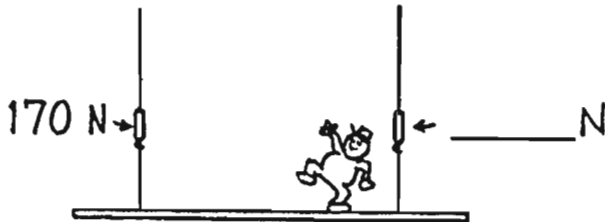
4-2

Statics

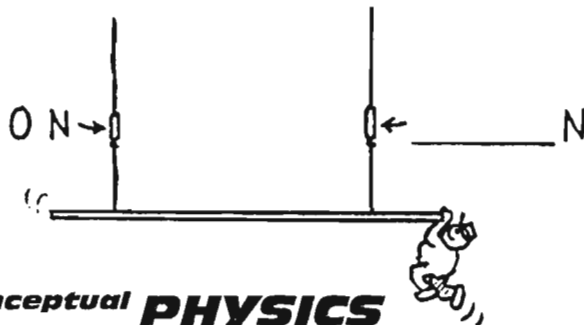
1. Little Nellie Newton wishes to be a gymnast and hangs from a variety of positions as shown. Since she is not accelerating, the net force on her is zero. This means the upward pull of the rope(s) equals the downward pull of gravity. She weighs 300 N. Show the scale reading for each case.



2. When Burl the painter stands in the exact middle of his staging, the left scale reads 500 N. Fill in the reading on the right scale. The total weight of Burl and staging must be _____ N.



3. Burl stands farther from the left. Fill in the reading on the right scale.



4. In a silly mood, Burl dangles from the right end. Fill in the reading on the right scale.

Falling and Air Resistance

Bronco skydives and parachutes from a stationary helicopter. Various stages of fall are shown in positions *a* through *f*. Using Newton's 2nd law,

$$a = \frac{F_{NET}}{m} = \frac{W - R}{m}$$

find Bronco's acceleration at each position (answer in the blanks to the right). You need to know that Bronco's mass m is 100 kg so his weight is a constant 1000 N. Air resistance R varies with speed and cross-sectional area as shown.

Circle the correct answers.

- When Bronco's speed is least, his acceleration is
(least) (most).
- In which position(s) does Bronco experience a downward acceleration?
(a) (b) (c) (d) (e) (f)
- In which position(s) does Bronco experience an upward acceleration?
(a) (b) (c) (d) (e) (f)
- When Bronco experiences an upward acceleration, his velocity is
(still downward) (upward also).
- In which position(s) is Bronco's velocity constant?
(a) (b) (c) (d) (e) (f)
- In which position(s) does Bronco experience terminal velocity?
(a) (b) (c) (d) (e) (f)
- In which position(s) is terminal velocity greatest?
(a) (b) (c) (d) (e) (f)
- If Bronco were heavier, his terminal velocity would be
(greater) (less) (the same).

