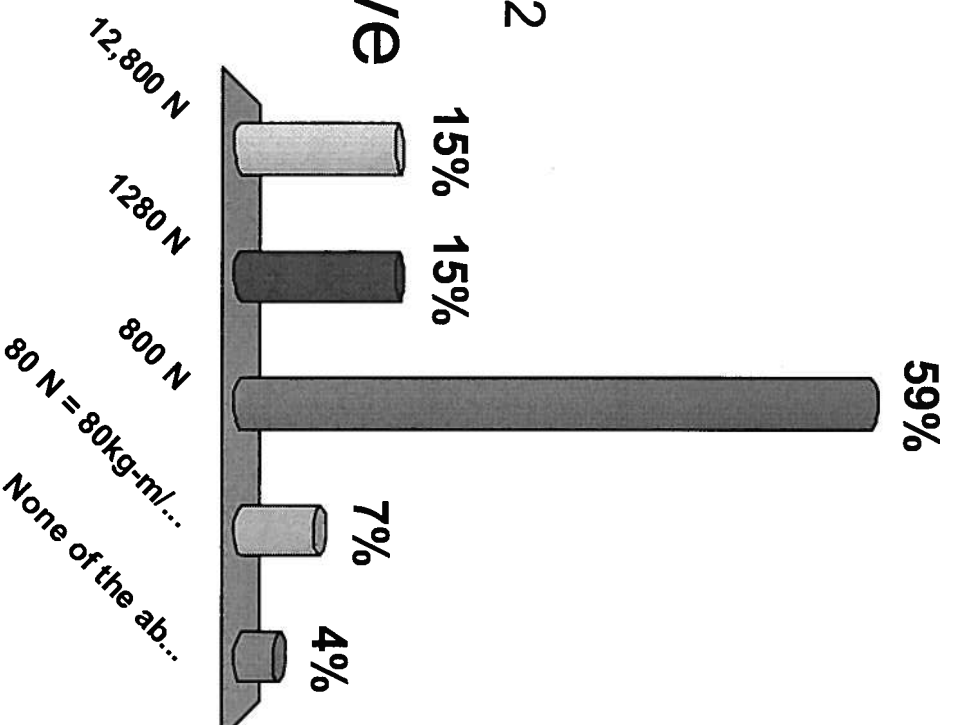


A 3200 kg car moving at 2m/s is brought to rest in 8 sec. by braking, which effects a constant frictional force between the road the the tires. The average frictional force must have had magnitude:

- a) 12,800 N
- b) 1280 N
- c) 800 N
- d) 80 N = 80kg-m/s²
- e) None of the above is correct within 10%



The correct answer is:

c) $800 \text{ N} = 800 \text{ kg}\cdot\text{m}/\text{s}^2$; as follows.

- By the Impulse/Momentum Theorem,
- $\Delta p = F \Delta t$, so that
- $F = \Delta p / \Delta t = (p_f - p_i) / \Delta t$
 $= (0 - 3200 \cdot 2) / 8 = -800 \text{ kg}\cdot\text{m}/\text{s}^2$
 $= -800 \text{ N}$, where the minus sign indicates that the force is directed opposite to the initial momentum; therefore,
- $|F| = 800 \text{ N}$, and answer c) is correct.
- (Note that NII gives the same calculation for a constant net force.)