

Name: _____ Student ID: _____

Quiz 3 Mechanics I

4.17 • Superman throws a 2400-N boulder at an adversary. What horizontal force must Superman apply to the boulder to give it a horizontal acceleration of 12.0 m/s^2 ?

IDENTIFY and SET UP: $F = ma$. We must use $w = mg$ to find the mass of the boulder.

EXECUTE: $m = \frac{w}{g} = \frac{2400 \text{ N}}{9.80 \text{ m/s}^2} = 244.9 \text{ kg}$

Then $F = ma = (244.9 \text{ kg})(12.0 \text{ m/s}^2) = 2940 \text{ N}$.

EVALUATE: We must use mass in Newton's second law. Mass and weight are proportional.

2. Two forces of magnitudes 8 N and 6 N are added to each other. Which of the following values CANNOT be a resultant of these two forces? Explain why

- A 2 N
- B 3 N
- C 14 N
- D 16 N

Answer: D. In a vector sum, magnitude of the resultant R must fall in to the range $|F_1 - F_2| < R < |F_1 + F_2|$