Forces and Newton's Laws

Forces and motion · 4 questions · step-by-step answers at the end

Name: Date: Score: / 4

USEFUL EQUATIONS

$F = ma$ $W = mg$ $g \approx 9.8$ N/kg

Questions

Show your working in the space under each question.

1. What is the weight of a 65 kg person on Earth, and on the Moon where g = 1.6 N/kg?

2. A 1200 kg car has a driving force of 3000 N and total resistive forces of 600 N. Find its acceleration.

3. Forces of 3.0 N east and 4.0 N north act on an object. Find the resultant.

4. A book rests on a table. Name the Newton's third law partner of the book's weight.

Step-by-step answers

Forces and Newton's Laws

1. Earth: 65 × 9.8 = **637 N**. Moon: 65 × 1.6 = **104 N**. The mass is 65 kg in both places.

2. 1. Resultant force = 3000 − 600 = **2400 N** forwards.
2. a = F/m = 2400/1200 = **2.0 m/s²**.
3. As the car speeds up, air resistance grows, so the acceleration falls until the forces balance.

Answer: 2.0 m/s²

3. $\sqrt{(3.0^2 + 4.0^2)}$ = **5.0 N**, at 53° north of east.

4. The **gravitational pull of the book on the Earth**. (The push of the table is a different type of force, so it is not the partner.)