

Question 3 (Answer: **C**)

- Weight is the force of gravity on a mass: $W = mg$.
- Use the value of g for Mars, not for Earth.
- $W = 600 \times 4.0 = 2400 \text{ N}$.

Question 4 (Answer: **A**)

- A balance works by comparing an unknown mass against known ones.
- So it compares masses directly, and its reading does not depend on g .
- A protractor measures angles, a stop-watch time and a voltmeter potential difference.

2(a)	(gravitational field strength is) force per unit mass (on an object in a gravitational field)
2(b)(i)	16 N
	$W = mg$ OR ($m =$) $W \div g$ OR $42 / 9.8$ OR (mass of object =) 4.3 (kg)
2(b)(ii)	$1.6 \times 10^{20} \text{ m}^3$
	$(V =) m / \rho$ OR $(V =) 6.4 \times 10^{23} / 3900$
2(c)(i)	arrow parallel to driving force AND pointing to the right
2(c)(i)	(arrow pointing to the right) labelled 30 N
2(c)(ii)	1 (resultant force) increases OR there is a resultant force (in the direction of the driving force)
	OR 2 resultant force = driving force – resistive force(s)

Question 2 (Answer: **B**)

- Mass is the quantity of matter in an object.
- It is measured in kilograms and does not change with location.
- Weight is the *force* of gravity on that mass, and density is mass per unit volume.

Question 3 (Answer: **C**)

- Mass is the quantity of matter, so it does not depend on where the object is.
- Weight is mg , so it changes when the gravitational field strength changes.
- So the mass stays the same and the weight changes.

Question 4 (Answer: **D**)

- A spring stretches according to the *force* pulling on it, which is the weight.
- On the Moon g is one sixth, so each kilogram weighs only one sixth as much.
- To produce the same force you therefore need six times the mass: $6 \times 3.0 = 18 \text{ kg}$.

Question 6 (Answer: **A**)

- The measuring cylinder gives the volume, from the rise in the water level.
- Density is mass divided by volume, so the mass is still needed.
- A balance is the instrument that measures mass.