18. R · Forces and Newton's laws

Starter Quiz ·

AQA · A-Level · Mathematics Name: _____ Score: _____

1. A resultant force of 15 N acts on a 3 kg mass. Find its acceleration.

   _____ m/s^2

2. An object moving at constant velocity has a resultant force of zero.

   ☐ True ☐ False

3. A 10 kg box rests on a rough floor with $\mu = 0.4$. What is the largest friction force possible ($g = 9.8$)?

   _____ N

4. A 5 kg block is pulled by 30 N along a rough floor with $\mu = 0.2$. Find the acceleration to 3 s.f.

   _____ m/s^2

5. Masses of 6 kg and 4 kg hang over a smooth pulley. Find the acceleration ($g = 9.8$).

   _____ m/s^2

6. A 4 kg box is pulled by 20 N at 30° above the horizontal. Find the normal reaction ($g = 9.8$).

   ☐ 39.2 N

   ☐ 29.2 N

   ☐ 49.2 N

   ☐ 20 N

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1. **5 m/s^2**

   $a = \frac{F}{m}$.

2. **True**

   Newton's first law.

3. **39.2 N**

   $\mu R = 0.4 \times 98$.

4. **4.04 m/s^2**

   $R = 49$, $F = 9.8$, $a = \frac{30-9.8}{5}$.

5. **1.96 m/s^2**

   $\frac{(6-4)g}{10}$.

6. 29.2 **N**

   $R + 20\sin 30° = 39.2$.