InkMaths

QUESTION WORKBOOK

Work, energy and power

Further Mechanics 1 · Year FM

6 questions · 20 marks

NAVY SCREEN EDITION

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SECTION A · Warm-up

A1 State the formula for work done by a constant force, and explain why the normal reaction never appears in an energy equation. [2]

A2 A force of 40 N acts at 25° to the direction of motion while an object moves 12 m. Find the work done. [3]

SECTION B · Standard

B1 A particle of mass 60 kg slides from rest 10 m down a slope at 20° to the horizontal, with coefficient of friction 0.3. Find its speed at the bottom, taking $g = 9.8\ \text{m/s}^2$. [4]

B2 A car of mass 900 kg works at 12 kW. At 20 m/s the resistance is 400 N. Find the acceleration then, and the maximum speed if the resistance stays constant. [4]

B3 Explain why a car's acceleration falls as it speeds up, even though the engine works at constant power. [3]

SECTION C · Stretch

C1 A cyclist and bicycle of total mass 80 kg ride at a steady 6 m/s up a slope of 1 in 20 against a resistance of 25 N. Find the power developed. [4]