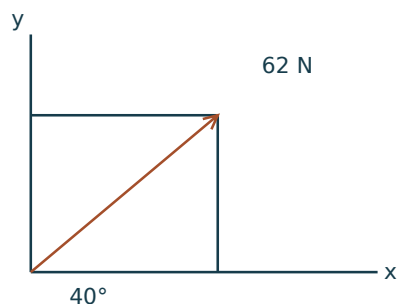


Forces, energy and momentum

Questions · Set 42 · Selected AQA 7408 / OCR A H556 skills
Treat the given values as exact unless an uncertainty is stated.

Question 1

A force of 62 N acts at 40° above the positive horizontal direction. Find the magnitude of its horizontal component. Give your answer to 3 significant figures.

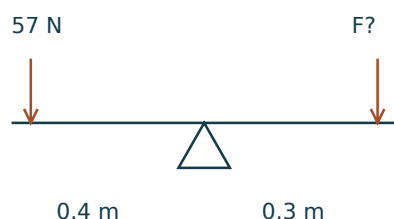


forces-equilibrium / horizontal-component / v1.0.0 / seed 42

Check this question online: [physicshelp.co.uk/tools/forces-equilibrium/](https://www.physicshelp.co.uk/tools/forces-equilibrium/)

Question 2

A light horizontal beam is pivoted at its centre. A downward 57 N load acts 0.4 m to the left. What downward force 0.3 m to the right balances its moment? Ignore the beam's weight. Give your answer to 3 significant figures.



forces-equilibrium / balance / v1.0.0 / seed 104771

Check this question online: [physicshelp.co.uk/tools/forces-equilibrium/](https://www.physicshelp.co.uk/tools/forces-equilibrium/)

Forces, energy and momentum

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Question 3

A constant 26 N force pulls an object through a horizontal displacement of 5 m. The force is 60° above the displacement direction. Find the work done by this force. Give your answer to 3 significant figures.

energy-momentum / angled-work / v1.0.0 / seed 209500

Check this question online: [physicshelp.co.uk/tools/energy-momentum/](https://www.physicshelp.co.uk/tools/energy-momentum/)

Question 4

A motor raises a 42 kg load through 3 m in 8 s at constant speed. Use $g = 9.81 \text{ m s}^{-2}$. Find the useful average lifting power. Give your answer to 3 significant figures.

energy-momentum / lifting-power / v1.0.0 / seed 314229

Check this question online: [physicshelp.co.uk/tools/energy-momentum/](https://www.physicshelp.co.uk/tools/energy-momentum/)

Forces, energy and momentum

Questions · Set 42 · Selected AQA 7408 / OCR A H556 skills
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Question 5

On a horizontal track, a 4 kg trolley at $+7 \text{ m s}^{-1}$ collides with a 5 kg trolley at -1 m s^{-1} . They stick together. External horizontal impulse is negligible. Find their signed common velocity. Give your answer to 3 significant figures.

energy-momentum / inelastic-collision / v1.0.0 / seed 418958

Check this question online: [physicshelp.co.uk/tools/energy-momentum/](https://www.physicshelp.co.uk/tools/energy-momentum/)

Question 6

A 0.4 kg ball changes velocity from $+10$ to -2 m s^{-1} during contact lasting 0.04 s. Positive is the initial direction. Find the signed impulse on the ball. Give your answer to 3 significant figures.

energy-momentum / rebound-impulse / v1.0.0 / seed 523687

Check this question online: [physicshelp.co.uk/tools/energy-momentum/](https://www.physicshelp.co.uk/tools/energy-momentum/)

Worked answers

Forces, energy and momentum

Keep intermediate values unrounded. Final answers use 3 significant figures.

Question 1

$$F_x = 62 \times \cos(40^\circ) \text{ N.}$$

Answer: $4.75 \times 10^1 \text{ N}$ (3 significant figures).

Question 2

$$57 \times 0.4 = F_{\text{right}} \times 0.3.$$

$$F_{\text{right}} = 57 \times 0.4 / 0.3 \text{ N.}$$

Answer: $7.60 \times 10^1 \text{ N}$ (3 significant figures).

Question 3

$$W = 26 \times 5 \times \cos(60^\circ) \text{ J.}$$

Answer: $6.50 \times 10^1 \text{ J}$ (3 significant figures).

Question 4

$$\Delta E_p = 42 \times 9.81 \times 3 \text{ J.}$$

$$\text{Useful power} = (42 \times 9.81 \times 3) / 8 \text{ W.}$$

Answer: $1.55 \times 10^2 \text{ W}$ (3 significant figures).

Question 5

$$(4+5)v = 4 \times 7 + 5 \times (-1).$$

$$v = (23) / (9) \text{ m s}^{-1}.$$

Answer: 2.56 m s^{-1} (3 significant figures).

Question 6

$$\text{Impulse} = 0.4 \times (-2 - 10) = -4.8 \text{ N s.}$$

Answer: -4.80 N s (3 significant figures).