

How fast and how quickly speeding up

Physics grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test covers scalars and vectors, average speed, displacement and acceleration. Show every step, include units and give answers to a sensible number of significant figures. Calculators are allowed.

Level: Physics grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** IGCSE 1.2, HS-PS2-1

Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Scalars and vectors (2 marks)

- State whether displacement is a scalar or a vector. (1 mark)
- State whether speed is a scalar or a vector. (1 mark)

Question 2 Jogger's speed (3 marks)

Wanjiru jogs 1.8 km in 12 minutes.

- Convert the distance and time to metres and seconds. (1 mark)
- Calculate her average speed in m/s. (2 marks)

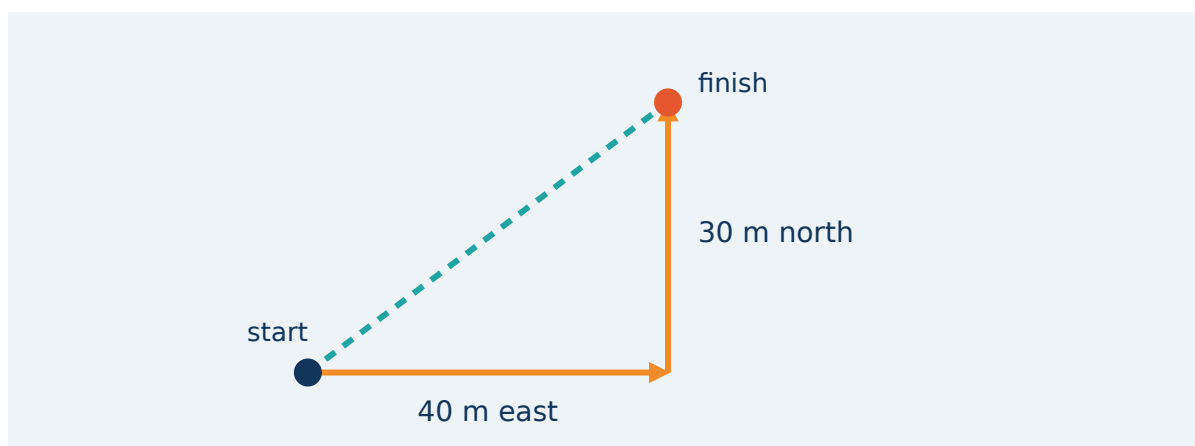
Question 3 Acceleration of a bike (3 marks)

A cyclist's velocity increases from 6.0 m/s to 24 m/s in 4.5 s. Calculate the acceleration. (3 marks)

Question 4 Across a field (3 marks)

A walker crosses a field as shown.

- Calculate the distance walked. (1 mark)
- Calculate the magnitude of the displacement. (2 marks)



The route across the field.

Question 5 Bus braking (2 marks)

A bus slows from 15 m/s to rest in 6.0 s. Calculate its acceleration and say what the sign shows. (2 marks)

Question 6 Acceleration at steady speed (2 marks)

Explain why a car travelling round a circular track at a constant 20 m/s is accelerating. (2 marks)

Question 7 Final velocity (3 marks)

A skateboard moves at 2.0 m/s and accelerates at 0.50 m/s² for 12 s. Write the equation used and calculate its final velocity. (3 marks)

Question 8 Average speed of a run (2 marks)

A runner covers 150 m in 20 s and then another 150 m in 30 s. Calculate her average speed for the whole 300 m. (2 marks)