



Ρ Σ Λ Κ
PHYSICS & CHEMISTRY

Physics

Preliminary Course

Module 1
Kinematics

Module 1: Kinematics

Topic 1.1: Motion in a Straight Line

————— **Foundation** —————

1. Convert the following speed values into m s^{-1} .

(a) 60 km h^{-1}

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(b) 80 km h^{-1}

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(c) 90 km h^{-1}

.....

★ 16.7 m s^{-1} , 22.2 m s^{-1} , 25 m s^{-1} ★

2. Convert the following speed values into km h^{-1} .

(a) 10 m s^{-1}

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(b) 27 m s^{-1}

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(c) 45 m s^{-1}

.....

★ 36 km h^{-1} , 97.2 km h^{-1} , 162 km h^{-1} ★

3. Define the following terms and give TWO examples of each.

(a) Scalar quantity

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(b) Vector quantity

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4. Compare the differences between the following terms:

(a) Distance and displacement

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(b) Speed and velocity

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.....

5. Calculate the distance travelled when:

(a) A person walks for 3 hours at an average speed of 4 km h^{-1} .

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.....

(b) A car travels from home to school for 20 minutes at an average speed of 60 km h^{-1} .

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★ 12 km, 20 km ★



————— Development —————

1. A car travels 10 km east and then 40 km west.

(a) Calculate the distance travelled by the car.

1

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.....

(b) Calculate the displacement of the car at the end of the trip.

1

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.....

★ 50 km, 30 km west ★

2. A car travels 10 km north and then 5 km south. The total trip took 15 minutes.

(a) Calculate the average speed of the car during this trip in m s^{-1} .

2

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(b) Calculate the average velocity of the car during this trip in m s^{-1} .

2

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★ 16.67 m s^{-1} , 5.56 m s^{-1} north ★

3. A hare and a tortoise competed against each other in a 1 km race. The tortoise has a maximum speed of 0.075 m s^{-1} while the hare has a maximum speed of 20 m s^{-1} . Both animals ran at their maximum speed throughout the race, however, the hare took a nap in the middle of the race. 3

If both the hare and the tortoise crossed the finish line at the same time, calculate the duration of the hare's mid-race nap.

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★ 13283.33 s ★

SAMPLE