Multiple choice questions - Rates of change and areas under graphs

Year: Year 11 · 10

Question 1 The gradient of a distance-time graph is

- ◯ **A.** acceleration
- ◯ **B.** speed
- ◯ **C.** distance
- ◯ **D.** time

Question 2 A horizontal line on a distance-time graph means the object is

- ◯ **A.** moving at constant speed
- ◯ **B.** accelerating
- ◯ **C.** stationary
- ◯ **D.** returning

Question 3 The area under a velocity-time graph gives

- ◯ **A.** acceleration
- ◯ **B.** speed
- ◯ **C.** distance travelled
- ◯ **D.** time

Question 4 36 km/h in m/s is

- ◯ **A.** 10
- ◯ **B.** 36
- ◯ **C.** 3.6
- ◯ **D.** 129.6

Question 5 A car goes from 0 to 20 m/s in 5 s. Its acceleration is

- ◯ **A.** $100\ \mathrm{m/s^2}$
- ◯ **B.** $4\ \mathrm{m/s^2}$
- ◯ **C.** $15\ \mathrm{m/s^2}$
- ◯ **D.** $0.25\ \mathrm{m/s^2}$

Question 6 Velocity rises steadily from 6 to 10 m/s over 4 s. Distance travelled is

- ◯ **A.** 16 m
- ◯ **B.** 24 m

- ◯ **C.** 32 m
- ◯ **D.** 40 m

Question 7 (Higher) Trapezia are used to estimate the area under a curve that bends downwards. The estimate is

- ◯ **A.** an overestimate
- ◯ **B.** an underestimate
- ◯ **C.** exact
- ◯ **D.** impossible to tell

Question 8 A straight line on a velocity-time graph with negative gradient shows

- ◯ **A.** constant speed
- ◯ **B.** acceleration
- ◯ **C.** deceleration
- ◯ **D.** no motion

Question 9 A journey of 150 km takes 2.5 hours. The average speed is

- ◯ **A.** 50 km/h
- ◯ **B.** 60 km/h
- ◯ **C.** 375 km/h
- ◯ **D.** 62.5 km/h

Question 10 (Higher) The gradient of a tangent to a distance-time curve gives

- ◯ **A.** total distance
- ◯ **B.** the speed at that instant
- ◯ **C.** the average speed overall
- ◯ **D.** the acceleration

Answer grid - Rates of change and areas under graphs

Year: Year 11

Question	Answer	Explanation
1	**B**	Distance divided by time is speed.
2	**C**	Distance is not changing.
3	**C**	Velocity multiplied by time is distance.
4	**A**	36 divided by 3.6 is 10.
5	**B**	20 divided by 5.
6	**C**	Trapezium: half of (6+10) times 4 is 32.
7	**B**	Chords lie below a concave curve.
8	**C**	Speed is decreasing.
9	**B**	150 divided by 2.5.
10	**B**	Instantaneous rate of change of distance is speed.