# Velocity-Time Graph Questions for GCSE Physics

**1.** What is plotted on the x-axis and y-axis of a velocity–time graph?

*y-axis is the time;  x-axis is the velocity*

**2.** How is constant velocity shown on a velocity–time graph?

*A horizontal line (or a gradient of zero)*

**3.** What does the gradient of a velocity–time graph represent?

*The acceleration*

**4.** What does the area under a velocity–time graph represent?

*The distance travelled*

**5.** A horizontal line on a distance–time graph means the object is stationary. What does a horizontal line mean on a velocity–time graph?

*The horizontal line represents constant velocity*

**6.** A car accelerates from 0 to 20 m/s in 5 s. Calculate its acceleration.

*a = ∆v / t* *= (20 – 0) / 5* ***= 4 m/s²***

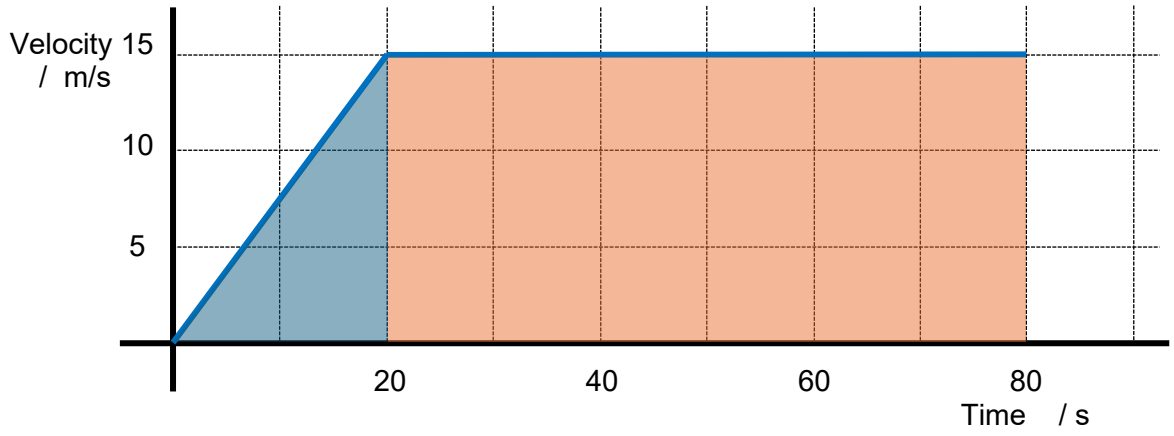
**7.** A bus travels at a constant velocity of 15 m/s for 30 s. How far does it travel?

*Distance = v t* *= 15 x 30* ***= 450m***

**8.** An object accelerates from rest at 2 m/s² for 8 s. What is its final velocity?

*a = ∆v / t* *2 = v / 8* *2 x 8 = v* ***= 16 m/s***

**9.**




Using the graph above, calculate the acceleration of the object during the first 20 seconds.

*a = ∆v / t* *= 15 / 20* *= 0.75 m/s²*

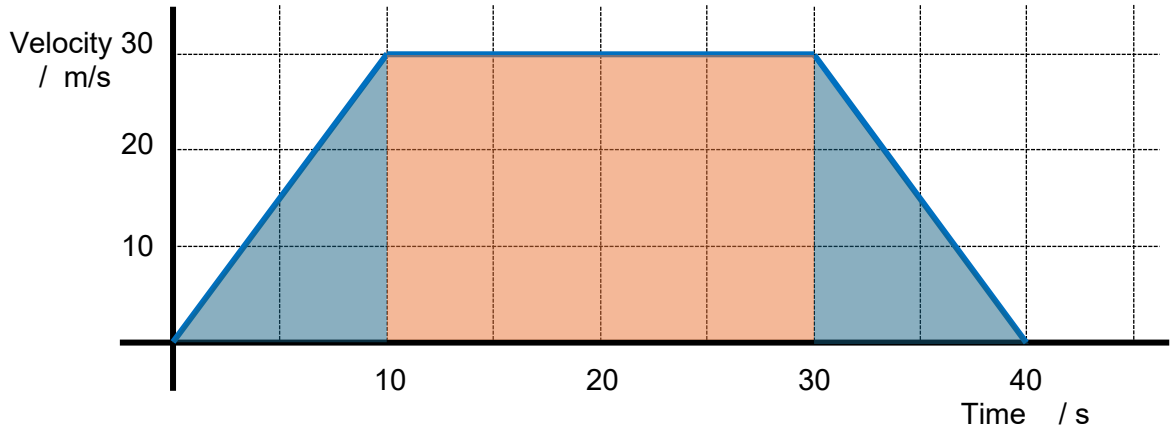
**10.** Using the graph from question **9** calculate the total distance travelled by the object in 80 seconds.

*Area of triangle = ½ x 20 x 15 = 150 m*

*Area of rectangle = 60 x 15 = 900 m*

*Total area = 150 + 900 = **1050 m***

**11.**




Calculate the deceleration of the object in this graph in the last 10 seconds of the journey.

*a = $\Delta v / t$ = (-)30 / 10 = (-)3 m/s$^2$*

*so the deceleration is **3 m/s$^2$***

**12.** What is the total distance travelled by the object shown in the graph for question **11**?

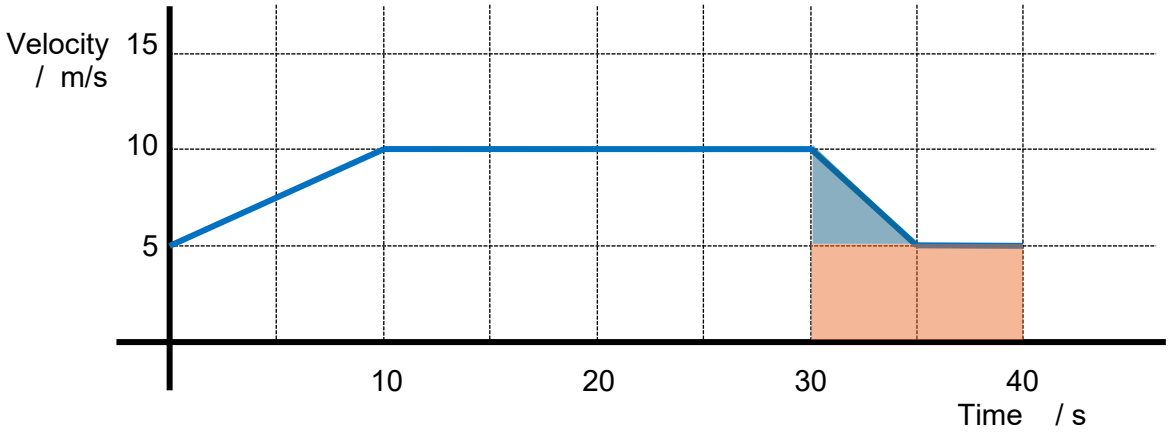
*Area of first triangle = ½ x 10 x 30 = 150 m*

*Area of rectangle = 20 x 30 = 600 m*

*Area of second triangle = ½ x 10 x 30 = 150 m*

*Total distance = 150 + 600 + 150 = **900 m***

**13.**




The graph above shows part of a car journey. What is the acceleration of the car in the first 10 seconds?

*a = ∆v / t* *= (10-5) / 10* *= 5 / 10* ***= 0.5 m/s²***

**14.** What is the acceleration of the car in question **13** from 30 to 35 seconds?

*a = ∆v / t* *= (5-10) / 5* *= (-)5 / 5* ***= -1 m/s²***

**15.** What is the distance travelled by the car in question **13** in the last 10 seconds of its journey?

*Area of triangle = ½ x 5 x 5 = 12.5 m*

*Area of rectangle = 10 x 5 = 50 m*

*Total distance = 12.5 + 50 =* ***62.5 m***