Foundation GCSE: Interpreting Real-Life Graphs

Name: _____ Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. On a distance-time graph, read the distance travelled at $t = 2$ hours if the line passes through $(2, 6)$.

2. Find the time taken to travel 60 km on a distance-time graph where the line passes through $(3, 60)$.

3. Identify the initial fixed charge (y-intercept) from a cost-against-hours graph where $C = 10 + 5h$.

4. Using Q3, find the cost of hiring for 4 hours.

5. Determine the speed during a steady section of a distance-time graph that rises 60 km in 4 hours.

6. State the physical meaning of a horizontal flat section on a distance-time graph.

7. Find the total distance travelled from a return journey distance-time graph that goes out to 60 km and returns.

8. Calculate the average speed for the whole journey in Q7 if the out-and-back trip took a total of 3 hours.

9. Find the gradient of a speed-time graph representing constant acceleration from 0 to 20 m/s in 4 seconds.

10. Interpret the y-intercept on a temperature-time cooling graph that starts at 60°C at $t = 0$.

11. Find the time when the temperature reaches 30°C given a cooling graph line passing through $(10, 30)$.

12. Determine which vehicle is travelling faster by comparing two lines on a distance-time graph: one with a gradient of 40 and one with 60.

13. Estimate the value at an intermediate point (interpolation) on a linear conversion graph at $x = 5$ between points $(0, 0)$ and $(10, 50)$.

14. Estimate the value beyond plotted points (extrapolation) on a trend graph following $y = 10x + 5$ when $x = 8$.

15. Find the rate of water flow in L/min from a volume-time filling graph with a constant gradient of 12.

16. Calculate total fuel used from a fuel-mass remaining graph dropping uniformly from 50 L to 12 L.

17. Interpret the point of intersection of two distance-time graphs representing a car catching up to a cyclist.

18. Find the time elapsed between the car starting at $t = 0$ and catching the cyclist at $t = 2$ hours.

19. Calculate the average deceleration magnitude from a velocity-time graph dropping from 30 m/s to 0 over 2.5 seconds.

20. Interpret the area under a speed-time graph shaped as a trapezium with parallel sides 4 and 8 and height 25 to find total distance.

Answers & Worked Solutions

1. 6 km – Read directly from graph at $t = 2$.
2. 3 hours – Read time corresponding to 60 km.
3. 10 – Y-intercept represents the fixed starting charge.
4. 30 – $C = 10 + 5(4) = 30$.
5. 15 km/h – Gradient = rise/run = $60/4 = 15$.
6. Stationary (stopped) – Zero speed/gradient.
7. 120 km – Total distance out and back (60+60).
8. 40 km/h – Total distance / total time (120/3).
9. 5 m/s^2 – Gradient = $20/4 = 5$.
10. 60°C – Initial temperature at $t = 0$.
11. 10 mins – Read time when temp = 30°C.
12. Gradient 60 – Steeper gradient indicates higher speed.
13. 25 – Linear interpolation midpoint between 0 and 50.
14. 85 – $y = 10(8) + 5 = 85$.
15. 12 L/min – Gradient of volume-time graph.
16. 38 L – $50 - 12 = 38$.
17. The car catches up to the cyclist (same position and time).
18. 2 hours – Time elapsed from start to intersection.
19. 12 m/s^2 – Magnitude = $(30 - 0)/2.5 = 12$.
20. 150 m – Area = $\frac{1}{2}(4 + 8) \times 25 = 150$.