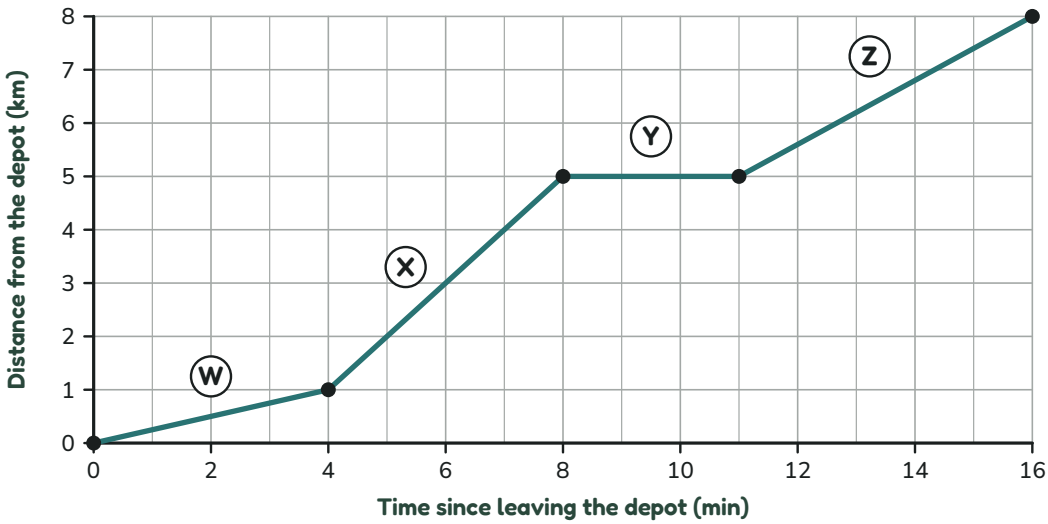
Distance-Time Graphs: One Tram Trip

Grades 6-8

Name _____ Date _____

Directions: The graph follows one tram from the moment it rolls out of the depot. The trip has four straight segments, tagged W, X, Y and Z, and every dot sits where two grid lines cross. Speed = distance covered ÷ time taken. Write every speed in kilometers per minute (km/min).



Invented practice trip, not a measured run. One small square is 1 minute across and 1 kilometer up.

1. Read the graph. (a) How far from the depot is the tram at 6 min? _____ km (b) At what time does it first reach the 5 km mark? _____ min

2. Which segment shows the tram standing still? _____ For how many minutes? _____ min Describe the line there.

3. Find the speed of two segments. Segment W: _____ km/min Segment Z: _____ km/min

4. Which of the four segments has the tram moving fastest? _____ Its speed there: _____ km/min

5. Look at the whole trip, start to end. Total distance: _____ km Total time, with the wait included: _____ min

6. Average speed for a whole trip = total distance ÷ total time. Use your two answers from item 5. Average speed: _____ km/min

7. A second tram leaves the same depot at 0 min and is 3 km away at 4 min. On this grid, would its line be steeper or less steep than segment W? Explain what that steepness shows about the second tram.

8. Suppose the tram keeps the speed of segment Z after the graph ends. How far from the depot will it be at 21 min? _____ km

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Answer key

One point for each blank in items 1 to 6 and item 8 (the written part of item 2 counts as one blank). Item 7: two points, one for the choice and one for what it means. For teachers who think in kilometers per hour: 0.25, 0.5, 0.6 and 1 km/min are 15, 30, 36 and 60 km/h.

1. **(a) 3 km; (b) 8 min**
   Start at 6 min on the time scale, move straight up to the line, then read across. For (b), move across from 5 km until you meet the first dot on that grid line, then read down.

2. **Segment Y; 3 min; the line is flat (horizontal).**
   From 8 min to 11 min the clock keeps running, but the reading stays at 5 km. Accept "level" or "it does not go up".

3. **Segment W: 0.25 km/min; segment Z: 0.6 km/min**
   W: 1 km in 4 min, so 1 ÷ 4 = 0.25. Z: 3 km in 5 min, so 3 ÷ 5 = 0.6. Accept 1/4 and 3/5.

4. **Segment X; 1 km/min**
   X gains 4 km in 4 min: 4 ÷ 4 = 1. It is also the segment that climbs most sharply on the grid.

5. **8 km; 16 min**
   The tram never turns back, so the last reading on the distance scale is the total distance.

6. **8 ÷ 16 = 0.5 km/min**
   Accept 1/2. Give the point for a correct division of the student's own item 5 answers. Adding the four segment speeds and dividing by 4 gives 0.4625, which is not the average speed, because the segments last different amounts of time.

7. **Steeper. The second tram is faster: it covers more distance in the same 4 minutes.**
   Second tram: 3 ÷ 4 = 0.75 km/min, against 0.25 km/min for segment W. Accept an answer without numbers if it links the sharper climb to the higher speed.

8. **11 km**
   21 − 16 = 5 more minutes at 0.6 km/min adds 3 km: 8 + 3 = 11. A wrong segment Z speed carried from item 3 and used correctly here still earns the point.