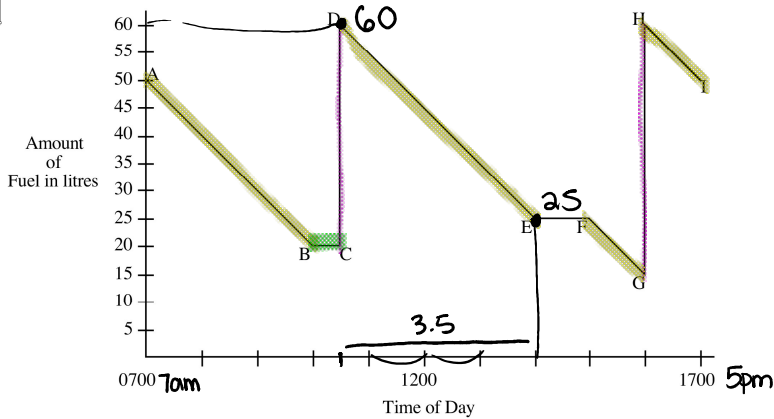


Functions Lesson #5: Interpreting Graphs of Functions



The Carter Family are driving to the Yukon for a family vacation. The graph represents the amount of fuel (in litres) in the gas tank of their car for the first day of their journey.



The graph of the journey is divided into eight line segments.

a) With reference to the journey, explain what is happening between:

- i) A and B drove for 3 hours using a constant amount of fuel
- ii) B and C rested for 30 mins
- iii) C and D refueled

b) What is the rate of fuel consumption (in litres per hour) between D and E?

$$60 - 25L = 35L / 3.5h \quad 10L/h$$

c) Which line segment represents the car being refueled for the second time?

d) Calculate the total time when the car was driven.

AB 3hrs DE 3.5hr HI 1hr FG 1hr 8.5hr

e) If fuel costs 85¢ per litre, calculate the cost of the fuel used for the first day of the journey.

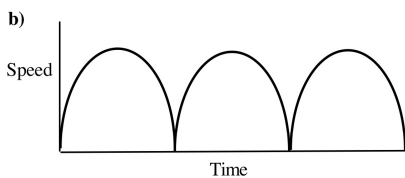
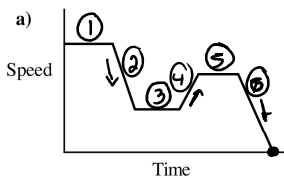
$$10L/h \times 8.5hr = 85L \times 0.85 = \text{\$}72.25$$

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326 Functions Lesson #5: Interpreting Graphs of Functions



Suggest a possible scenario for each of the following graphs:



- 1) Constant high speed (hwy)
- 2) Slows down for a bumpy road

- 5) Constant speed
- 6) Slows down to a stop.

- 2) Slows down for a bumpy road
- 3) Constant low speed
- 4) Speed up for normal road

b) Slows down to a stop.

b) Stop and go traffic

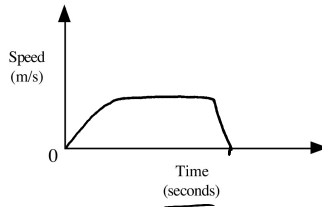
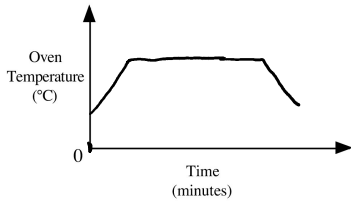
Sketching a Graph



Sketch a graph with no scale for each of the following *

a) the oven temperature when baking a pie

b) Ben taking part in a 100 m sprint



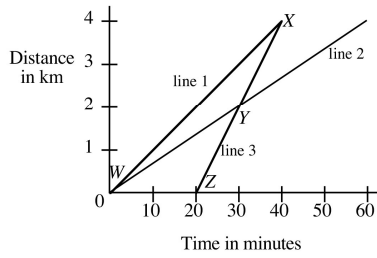
Complete Assignment Questions #1 - #12

#1, 2, 5 (#3 on webpage)

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Assignment

1. Amanda, Brittany, and Chelsea, each follow the same route to school. One morning Amanda cycles to school, Brittany walks to school, and Chelsea runs to school. Lines 1, 2, and 3, on the graph represent the three routes.



- a) Complete the table below.

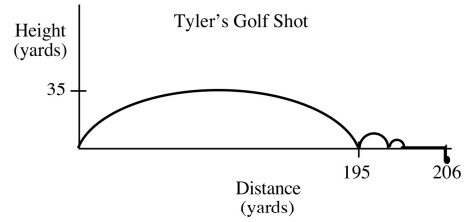
	Line 1	Line 2	Line 3
Distance (km)	4		
Time (hrs)	$\frac{2}{3}$		
Rate (km/hr)	6		
Student			

- b) Explain what is happening at the following points.

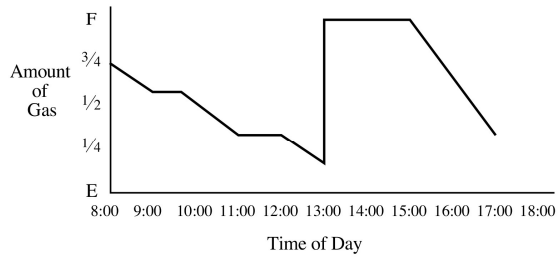
- i) W
- ii) X
- iii) Y
- iv) Z

- c) How can you tell from the steepness of the lines which line represents the route of each student?

2. Tyler, a member of St. Andrews High School golf team, hits a golf ball. The graph shows the path of the ball. Describe Tyler's golf shot.

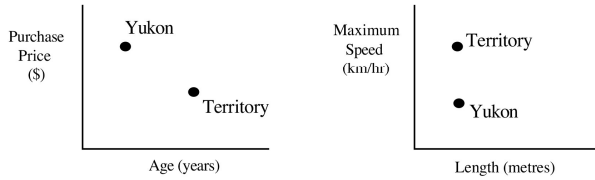


3. Dar sells medical supplies. The graph shows the amount of gasoline in his car during a particular day.



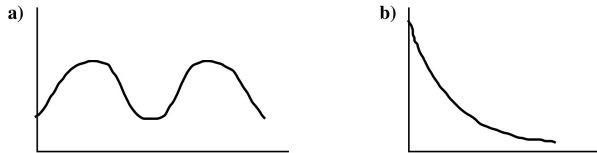
Describe how Dar may have spent the day.

4. The two graphs shown compare two yachts: the Yukon and the Territory. The first graph compares the yachts by age and cost. The second graph compares the boats by speed and length. Describe the comparison between the two yachts.



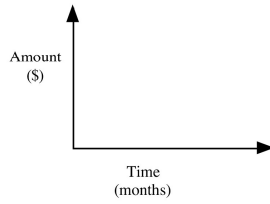
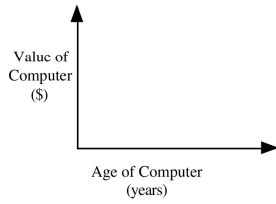
5. A super ball is dropped from a 10 m building. On each bounce, it bounces back to 80% of its previous height. Create a graph of height as a function of time.

6. Suggest a possible scenario for each of the following graphs.

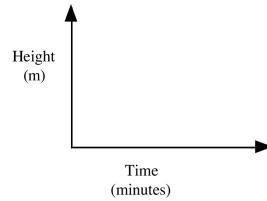
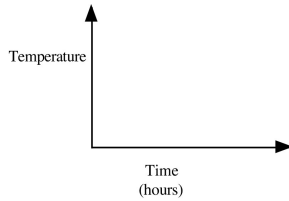


7. Sketch a graph with no scale to represent each of the following.

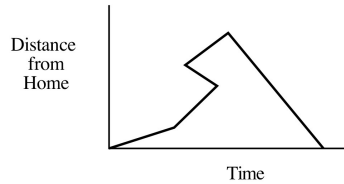
- a) A computer's value compared to its age in years. b) The amount of your savings if you save \$10 every month for a period of six months.



- c) The air temperature during a spring day from 6:00 a.m. to 6:00 p.m. d) You are sitting in the bottom chair of a ferris wheel. Graph your height above the ground during two rotations of the wheel.

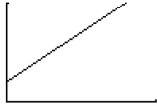
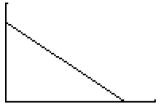
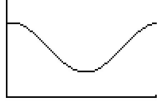
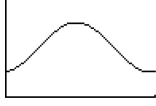
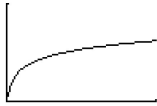



8. A student drew the following graph to represent a journey. Explain why the graph must be incorrect.



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Matching Match each description on the left with the best graph on the right. Each graph may be used once, more than once, or not at all.

<u>Description</u>	<u>Graph</u>	
<p>9. Sketch a graph of a person's height as a function of their age.</p>	<p>A. </p>	<p>B. </p>
<p>10. The number of hours of daylight in a given town in northern BC depends on the day of the year. Sketch a graph of the number of hours of daylight as a function of day of the year.</p>	<p>C. </p>	<p>D. </p>
<p>11. Sketch a graph of the area of a circle as a function of its radius.</p>	<p>E. </p>	<p>F. </p>

Answer Key (Answers may vary)

1. a) see table below

	Line 1	Line 2	Line 3
Distance (km)	4	4	4
Time (hrs)	$\frac{2}{3}$	1	$\frac{4}{3}$
Rate (km/hr)	6	4	$\frac{12}{4}$
Student	Chelsea	Brittany	Amanda

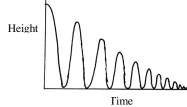
b) i) Chelsea and Brittany leave home at the same time.

ii) Chelsea and Amanda arrive at school.

iii) Amanda overtakes Brittany.

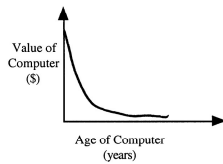
iv) Amanda leaves home 20 minutes after Brittany and Chelsea.

- c) The steeper the graph, the less time is taken to travel to school. The steepest slope represents the cyclist Amanda, the next steepest slope represents the runner Chelsea, and the remaining line represents the walker Brittany.
2. Tyler hits the ball through the air for a distance of 195 yards. The ball bounces twice and rolls into the hole. The golf shot travelled a total of 206 yards, and had a maximum height of 35 yards.
3. Dar left home at 8:00 AM with $\frac{3}{4}$ tank of gas in his car. He drove for about one hour, had a meeting for about $\frac{1}{2}$ hour, drove for about $1\frac{1}{2}$ hours, had a second meeting for one hour, and drove for about one hour. He refueled at 1 pm and had a lunch meeting for about 2 hours. He then drove home and arrived about 5 p.m. with a quarter tank of gas left.
4. The Territory is older than the Yukon, and its purchase price was less. Both the Territory and the Yukon are the same length, but the Territory can achieve a greater maximum speed.
5. see graph below

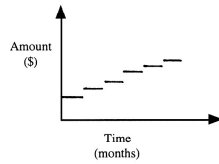


6. a) The number of hours of daylight per day over a period of two years for a location in the northern hemisphere.
- b) The value of a car depreciating over time.

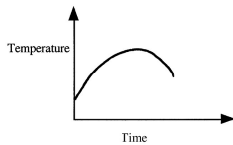
7. a)



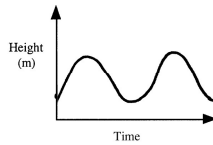
b)



c)



d)



8. The graph is not a function. The person cannot be at three different places at the same time.
9. E 10. D 11. F 12. B