Grade 8 Mathematics Worksheet

Equations and graphs

Questions:

1. Mataga is in need of an electrician to fix her faulty electric gate motor. She pages through the local newspaper, and comes across the following advertisements from two different service providers.

 Christie charges a callout fee of R250, and then charges a rate of R75 per hour plus then any additional electrical equipment.	 Lenogh Valley Electric charges a callout fee of R150, and then R125 per hour rate plus any additional electric equipment.

   a) Which one of the two should Mataga call to fix her gate motor?

   b) Draw a graph to convince Mataga of your choice.

   c) Is there a point where it does not matter which company you call out?

2. Draw neat sketch graphs representing **distance travelled over time** to portray the following scenarios:

   a) Katherine rode her bicycle from her house to the top of a nearby hill. First, she traveled very fast on a level road. Then, she traveled more and more slowly as she went up the hill.

   b) A ball that is thrown into the air and falls back to the ground

   c) A man driving to the shop at a constant speed without stopping. Shopping for one hour and then driving back home at a speed double that compared to when he went to the shop.

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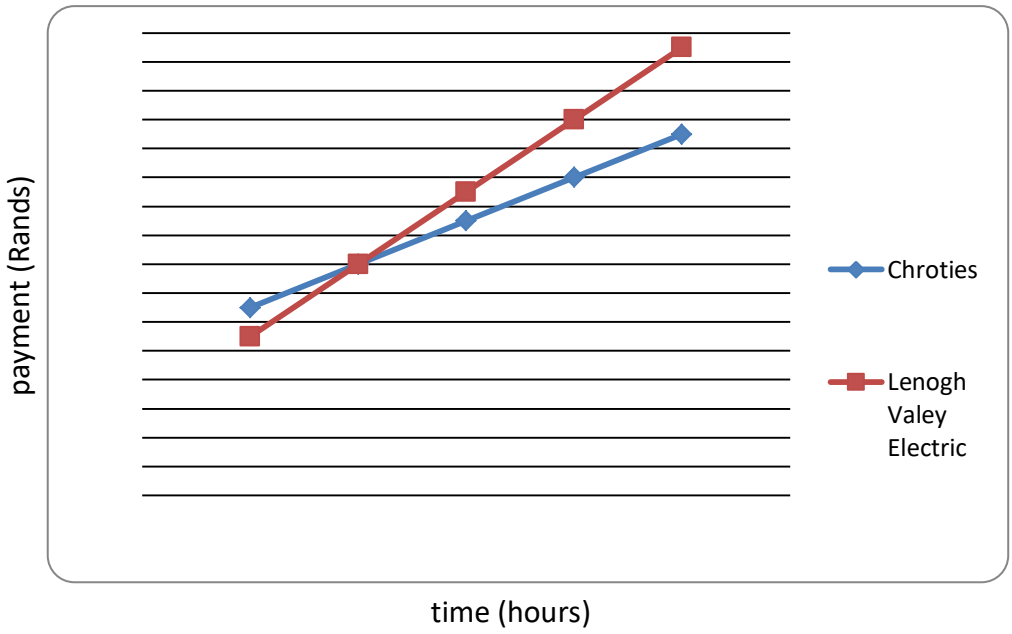
Solution

1. a) In order to answer this question, draw a table to see how the values increase in price.

# hours	Christie	Lenogh Valley Electric
1	325	275
2	400	400
3	475	525
4	550	650
5	625	775

Christie = R250 + 75h ; Lenogh = R150 + 125h.
If the gate takes less than 2 hours to complete then I would recommend Lenogh Valley Electric.

b)



As a step function it looks like this:

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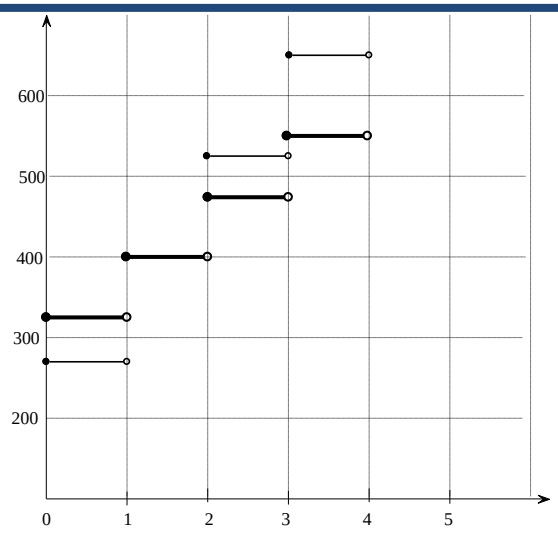
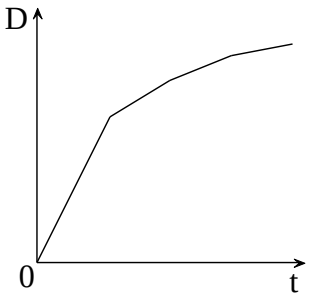
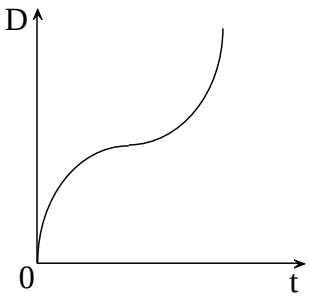


c) Yes, when the job takes them between one to two hours to complete. They charge per hour and here you will pay R400 for both during the second hour.

2. a)



b)



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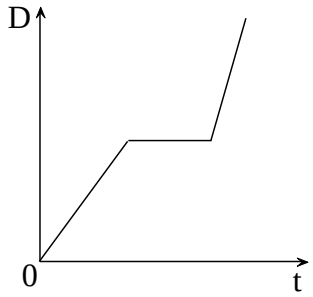
c)



The true nature of this function is a step function, as they charge per hour. It is therefore not a continuous function. For the next hour they charge an hourly rate. This is not made explicit in the question though, but it needs to be brought to the learner's attention.

The step function is a very useful function to introduce to the learners as quite a few of the charges in their everyday life happen in time intervals of an hour or a minute.

These are graphical models of relationships between variables.