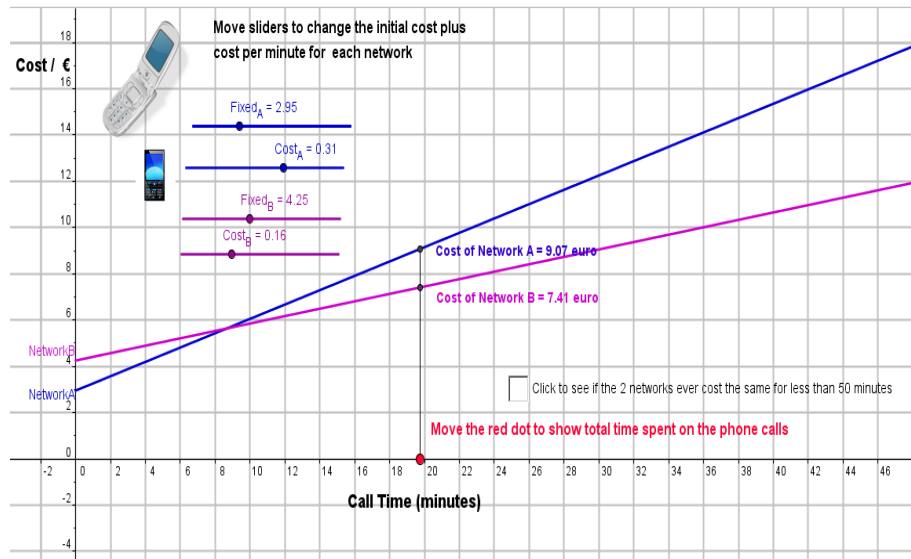## Student Activity: To investigate two mobile phone network charges

Use in connection with the interactive file, 'Phone Networks', on the Student's CD.

1. Eithan wishes to get a connection to a bill pay phone company and has two networks to choose from.

   Network A has a fixed charge of €4 per week and a charge of €0.10 per minute for calls.

   Network B has a fixed charge of €2 per week and a charge of €0.15 per minute for calls.

   Complete the following tables.

Network A			
Call time (Minutes)	Cost of calls	Standing charge	Total Cost
0			
10			
20			
30			
40			

Network B			
Call time (Minutes)	Cost of calls	Standing charge	Total Cost
0			
10			
20			
30			
40			

a. From the above tables, which network do you think offers the best deal if Eithan plans to use the phone to make calls for 10 minutes per week? Explain your answer.

_____

b. From the above tables, which network do you think offers the best deal if Eithan plans to use the phone to make calls for 20 minutes per week? Explain your answer.

_____

c. From the above tables, which network do you think offers the best deal if Eithan plans to use the phone to make calls for 30 minutes per week? Explain your answer.

_____

d. From the above tables, which network do you think offers the best deal if Eithan plans to use the phone to make calls for 40 minutes per week? Explain your answer.
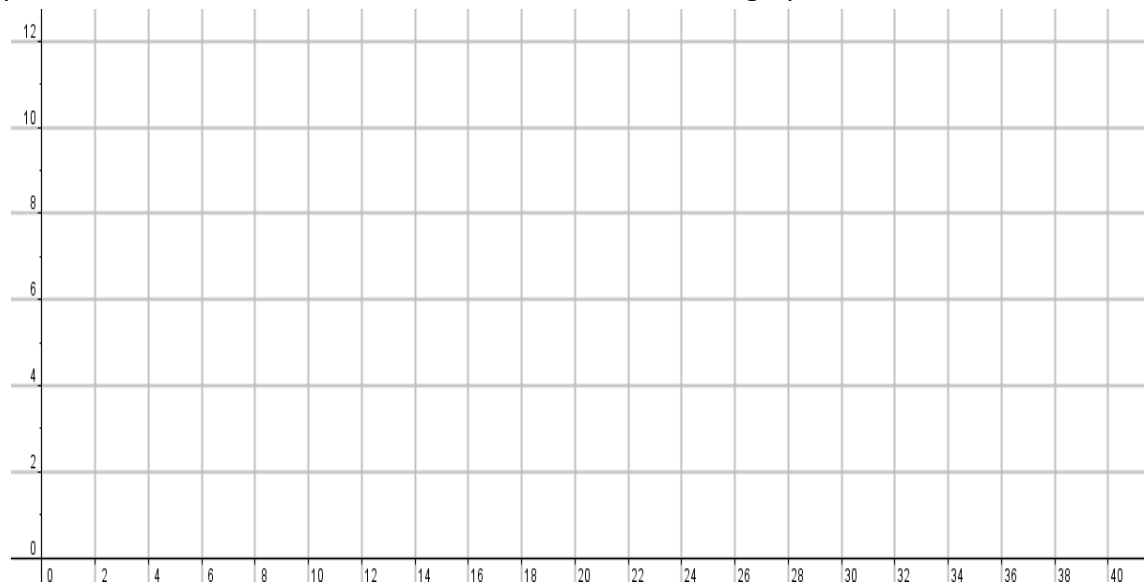
_____

e. Is there a pattern that determines the cost of using Network A? If so state it in

words._____

_____

f. What is the formula to represent the cost of using Network A for a week?

_____

g. Is there a pattern that determines the cost of using Network B. If so state it in

words._____

_____

h. What is the formula to represent the cost of using Network B for a week?

_____

i. Represent the information in the above tables on the same graph.

j. What would happen to the graph representing Network A if its standing charge was increased to €5 per week?

_____

k. What would happen to the graph representing Network B if its standing charge was decreased to €0 per week?

_____

l. Is the graph for each network linear? Give reasons for your answer.

_____

m. What determines where the line representing each network cuts the y axis?

_____

n. What determines the rate of change of a line representing a network and what is the rate of change of the line representing Network A?

_____

_____

o. Take any 2 points on the line representing network A and find the slope between these 2 points.

_____

_____

p. Is there any relationship between the rate of change of the line representing Network A and the slope of this line? If so state what it is.

_____

_____

q. What is the rate of change of the line representing Network B?

_____

r. Take any 2 points on the line representing network B and find the slope between these 2 points.

_____

_____

s. Is there any relationship between the rate of change of the line representing Network B and the slope of this line? If so state what it is.

_____

t. Suggest a set of circumstances where one network will always be more expensive than the other.

_____

_____

u. From the graph estimate how much time has to be spent on calls for both networks to cost the same amount?

_____

v. Use algebra to calculate the exact call time required so that both networks will have the same total cost.

_____

_____

w. A new network called Network C entered the market and Network C has a formula of Total Cost = €3+€0.18t (where t is the call time in minutes).

   i.   Explain this formula.

   _____

   _____

   ii. What would the cost of this network be if the call time was 30 minutes?

   _____

   iii. Will Network C ever have the same cost as Network A? Explain your answer.

   _____

   _____

   iv. Will Network C ever have the same cost as Network B? Explain your answer.

   _____

   _____