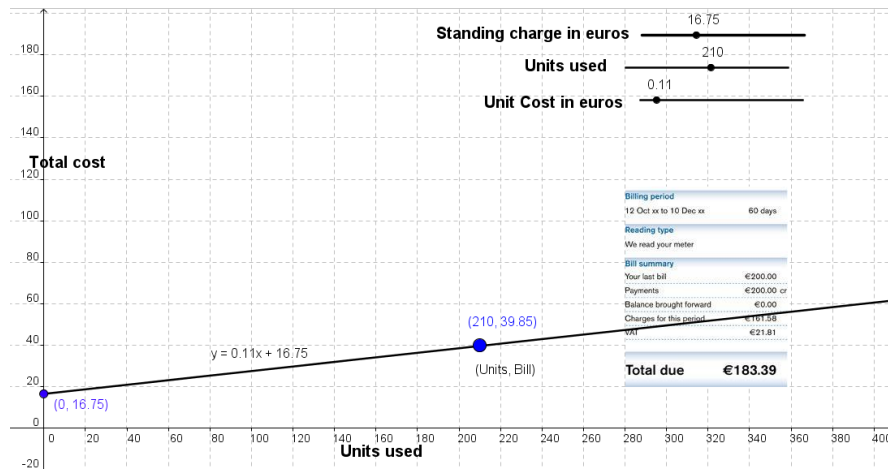


Student Activity: To investigate an ESB bill

Use in connection with the interactive file, 'ESB Bill', on the Student's CD.



1. What are the 2 main costs that contribute to your ESB bill?

2.

- a. Complete the following table to establish a household's ESB's costs, if the standing charge is €20 and the cost per unit is €0.10:

Units used	Cost of Units	Standing charge	Total Bill	Change in Total Bill
0				
50				
100				
150				
200				

- b. Draw a graph of the data represented in the table.



c. What shape is the graph? Explain your answer.

d. Where does this graph cut the y axis and what number does this relate to on the table?

e. What is the rate of change of the graph?

f. Find 2 points on the line and calculate the slope of the line.

g. Write an algebraic formula to represent the cost of an ESB bill using the charges used in this question?

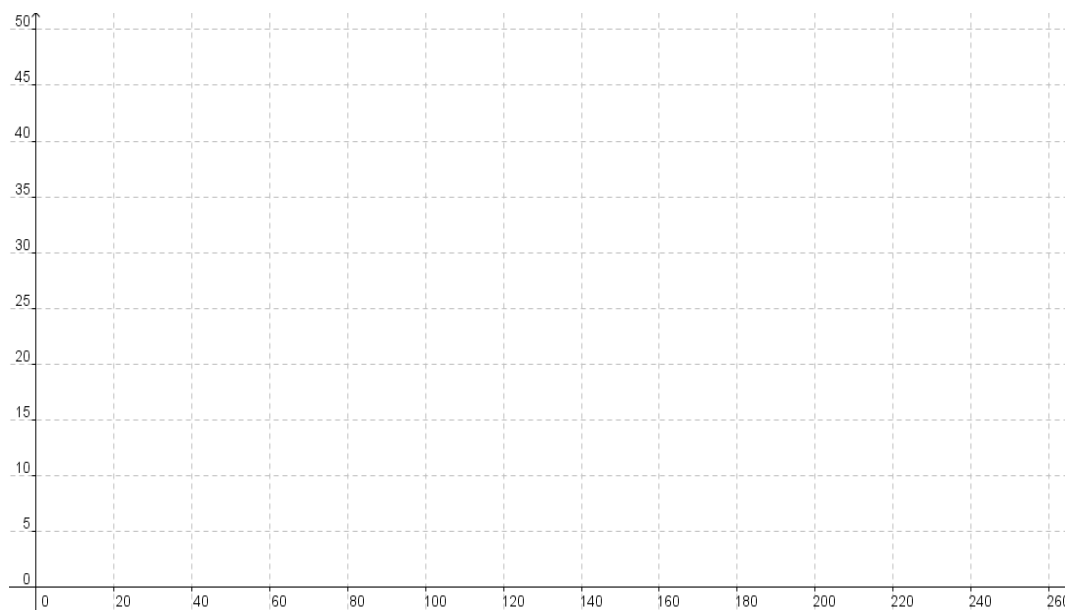
h. Where does the slope appear i) in the table, ii) in the graph and iii) in the formula?

3.

a. Complete the following table to establish a household's ESB's costs, if the standing charge is €15 and the cost per unit is €0.12:

Units used	Cost of Units	Standing charge	Total Bill	Change in Total Bill
0				
50				
100				
150				
200				

b. Draw a graph of the data represented in the table.



c. What shape is the graph? Explain your answer.

d. Where does this graph cut the y axis and what number does this relate to on the table?

e. What is the rate of change of the graph?

f. Find 2 points on the line and calculate the slope of the line.

g. Write an algebraic formula to represent the cost of an ESB bill using the charges used in this question?

h. Where does the slope appear i) in the table, ii) in the graph and iii) in the formula?

4. In the interactive file, what determines:
- a. Where the line cuts the y axis and where this is to be found in the equation of the line?

 - b. The slope of the line and where this is to be found in the equation of the line?

 - c. The point that represents the bill and where this is to be found in the equation of the line?

5. The current standing charge for your home is €12.25, the charge per unit is €0.11 and you used 250 units of electricity. What will your bill amount to assuming no extra charges? Show calculations and check your answer using the interactive file.

6. The current standing charge for your home is €22.25, the charge per unit is €0.10 and you used 260 units of electricity. What will your bill amount to assuming no extra charges? Show calculations and check your answer using the interactive file.

7. The current standing charge for your home is €32.25, the charge per unit is €0.11 and you used 256 units of electricity. What your bill will amount to assuming no extra charges? Show calculations and check your answer using the interactive file.

8. A family's last ESB bill was €44 and they used 200 units of electricity in that period. If the cost per unit was €0.12, what was the standing charge?

9. What 2 meter readings will be on your ESB bill?

10. How do you determine the number of units used by a household in a billing period?

11. If you are away on holidays for 2 months and used no electricity, will your bill be zero? Explain.

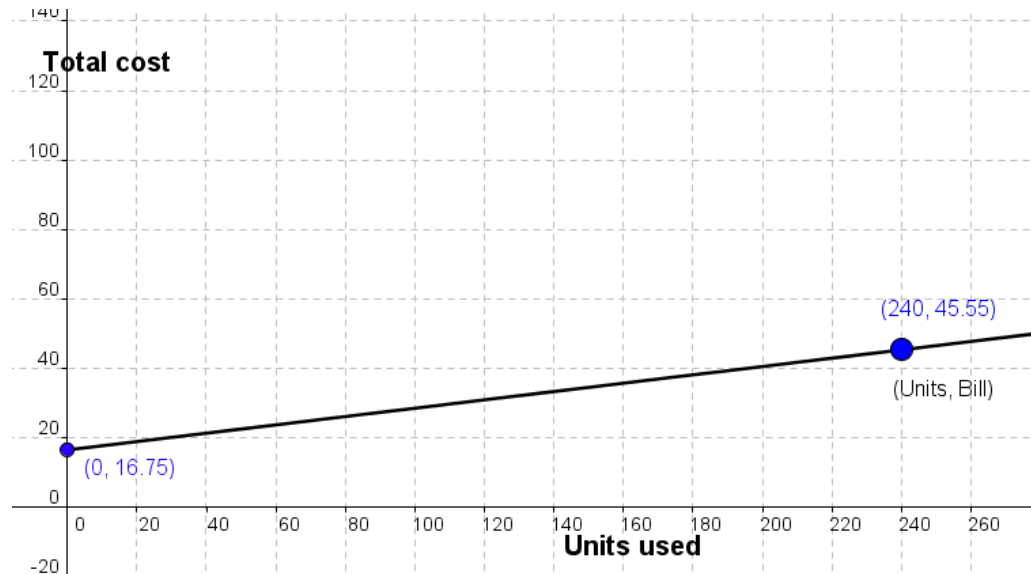
12. Which would be the better deal for a household that uses 300 units of electricity in a two month period? Explain your answer.

Deal A: Standing charge €30 and price per unit €0.10.

Deal B: Standing charge €10 and price per unit €0.20.

What type of household would each deal be more suited to? Explain your answer.

13.



- a. Using the diagram above, calculate the standing charge and the unit cost from the information shown.

- b. What is the equation of the line in the above diagram?

- c. Complete the table for the situation represented in the diagram above.

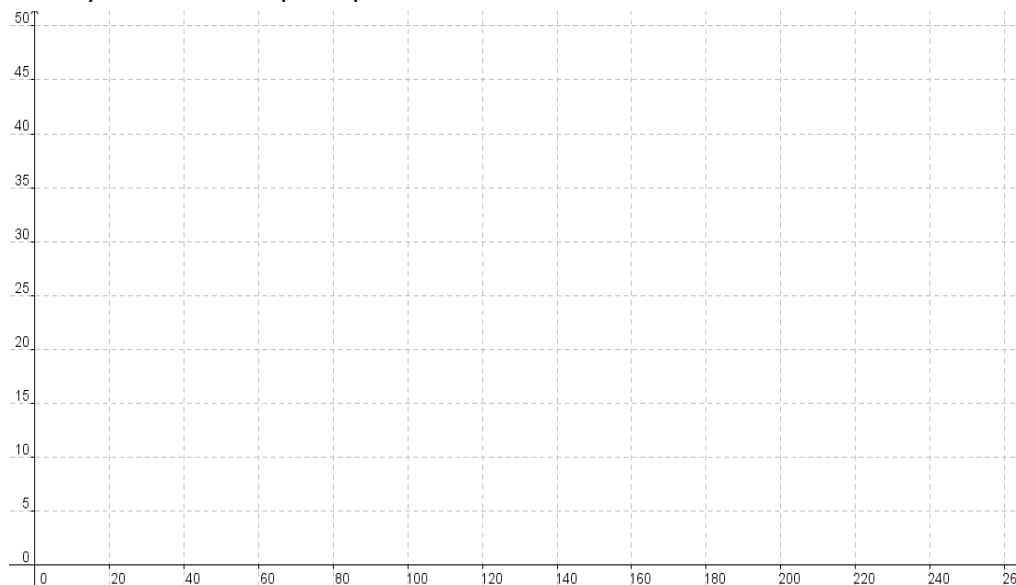
Units used	Cost of Units	Standing charge	Total Bill
0			
50			
100			
150			
200			

14.

- a. Complete the following table to represent the situation where the standing charge for electricity is €0 and the price per unit is €0.10.

Units used	Cost of Units	Standing charge	Total Bill
0			
50			
100			
150			
200			

- b. Draw a rough graph to represent the situation where the standing charge for electricity is €0 and the price per unit is €0.10.



- a. What is the formula that represents the situation where the standing charge for electricity is €0 and the price per unit is €0.10?

15. Jonathan forgot to pay his ESB bill for the last billing period and he used 200 units this period. The standing charge is €21 per 2 month period and the cost per unit is €0.10. If the bill for the 4 month period was €300, how many units did he use in the first 2 months assuming the charges remain the same? Show your calculations.

16. If the ESB abandoned its standing charge, but the amount of a household's bill did not increase, what 2 things could have happened?

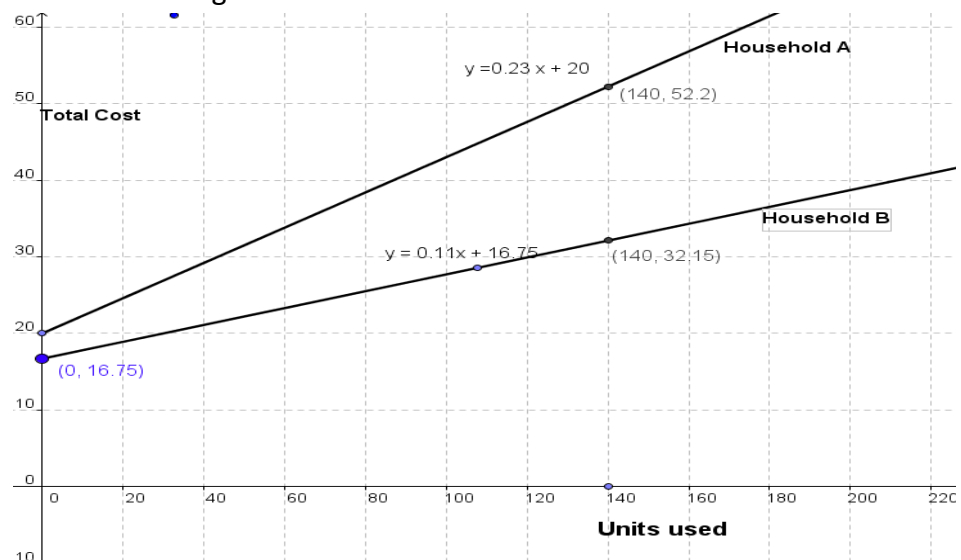
17. If you were told the number of units used vs. the total bill was represented by a linear graph $y=0.17x+10$. What does that tell you about the standing charge and cost per unit?

18. Describe what happens to the line in the interactive file if the cost of the standing charge for a household is increased.

19. Describe what happens to the line in the interactive file if the cost per unit is increased.

20.

a. Describe the cost of the bill Household A receives and the bill Household B receives in the diagram below.



b. Write down and then graph a situation where a household has a higher standing charge than household A in the diagram above but ends up with a bill which is below Household A's bill after a certain number of units. Draw a rough sketch of this situation.
