**Buying a mobile phone**:



There are many different ways to buy a mobile phone and different companies have different plans. The following plans are available to you:

**Plan A:** $300 to buy a phone outright and then spend $5 every month.

**Plan B:** $100 to buy a phone and then spend $12.50 every month.

**Plan C:** The phone is free with a minimum monthly spending of $50.

**1.** Fill in the total cost you would have to pay for each mobile phone plan described above in the table below.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time  (months) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Plan A |  |  |  |  |  |  |  |  |  |  |
| Plan B |  |  |  |  |  |  |  |  |  |  |
| Plan C |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time  (months) | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Plan A |  |  |  |  |  |  |  |  |  |  |
| Plan B |  |  |  |  |  |  |  |  |  |  |
| Plan C |  |  |  |  |  |  |  |  |  |  |

**2.** Using the table of values above, draw three graphs on the same axes below to represent each company’s mobile phone plan. Make sure you have labelled each graph separately.

Total Costs ($)



Time (months)

**3.** Using the graphs above, answer the following questions showing working where appropriate.

**Plan A:**

1. What is the rate of change (gradient) of the graph for **Plan A**?

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1. What is the vertical intercept (y-intercept) of the graph for **Plan A**?

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1. From the rate of change (gradient) and vertical intercept (y-intercept), what is the equation of the graph for **Plan A**?

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**Plan B:**

1. What is the rate of change (gradient) of the graph for **Plan B**?

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1. What is the vertical intercept (y-intercept) of the graph for **Plan B**?

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1. From the rate of change (gradient) and vertical intercept (y-intercept), what is the equation of the graph for **Plan B**?

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**Plan C:**

1. What is the rate of change (gradient) of the graph for **Plan C**?

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1. What is the vertical intercept (y-intercept) of the graph for **Plan C**?

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1. From the rate of change (gradient) and vertical intercept (y-intercept), what is the equation of the graph for **Plan C**?

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**4.** Look at the answers for the rate of change (gradient) of the graph for each company in Question 3. Describe how the answers relate to the information of each company’s plan.

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**5.** Look at the answers for the vertical intercept (y-intercept) of the graph for each company and describe how the answers relate to the information of each company’s plan.

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**6.** Use the dot points below to provide an accurate summary of which company’s plan is best and why.

* Which company’s plan is best if you intend to stay with a company for a short period of time (up to 4 months)? Why?

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* Which company’s plan is best if you intend to stay with a company for a moderate period of time (from 4 to 15 months)? Why?

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* Which company’s plan is best if you intend to stay with a company for a long period of time (longer than 15 months)? Why?

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**Using a mobile phone:**

There are many different plans that you can sign up to which enable you to use your mobile phone. Three such plans are outlined below:

**Plan A:** 1 cent per minute plus a 20 cent connection fee.

**Plan B:** 2 cent per minute plus a 5 cent connection fee.

**Plan C:** 3 cents per minute with no connection fee.

**1.** Fill in the total cost you would have to pay for each mobile phone plan described above in the table below.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time  (minutes) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Plan A |  |  |  |  |  |  |  |  |  |  |
| Plan B |  |  |  |  |  |  |  |  |  |  |
| Plan C |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time  (minutes) | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Plan A |  |  |  |  |  |  |  |  |  |  |
| Plan B |  |  |  |  |  |  |  |  |  |  |
| Plan C |  |  |  |  |  |  |  |  |  |  |

**2.** Using the table of values above, draw three graphs on the same axes below to represent each company’s mobile phone plan. Make sure you have labelled each graph separately.



Time (minutes)

Total Costs ($)

**3.** Using the graphs above, answer the following questions showing working where appropriate.

**Plan A:**

1. What is the rate of change (gradient) of the graph for **Plan A**?

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1. What is the vertical intercept (y-intercept) of the graph for **Plan A**?

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1. From the rate of change (gradient) and vertical intercept (y-intercept), what is the equation of the graph for **Plan A**?

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**Plan B:**

1. What is the rate of change (gradient) of the graph for **Plan B**?

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1. What is the vertical intercept (y-intercept) of the graph for **Plan B**?

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1. From the rate of change (gradient) and vertical intercept (y-intercept), what is the equation of the graph for **Plan B**?

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**Plan C:**

1. What is the rate of change (gradient) of the graph for **Plan C**?

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1. What is the vertical intercept (y-intercept) of the graph for **Plan C**?

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1. From the rate of change (gradient) and vertical intercept (y-intercept), what is the equation of the graph for **Plan C**?

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**4.** Look at the answers for the rate of change (gradient) of the graph for each company in Question 3. Describe how the answers relate to the information of each company’s plan.

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**5.** Look at the answers for the vertical intercept (y-intercept) of the graph for each company and describe how the answers relate to the information of each company’s plan.

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**6.** Use the dot points below to provide an accurate summary of which company’s plan is best and why.

* Which company’s plan is best if you intend to make short calls (up to 5 minutes)? Why?

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* Which company’s plan is best if you intend to talk for a moderate period of time (from 5 to 15 minutes)? Why?

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* Which company’s plan is best if you intend to talk for a long period of time (longer than 15 minutes)? Why?

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