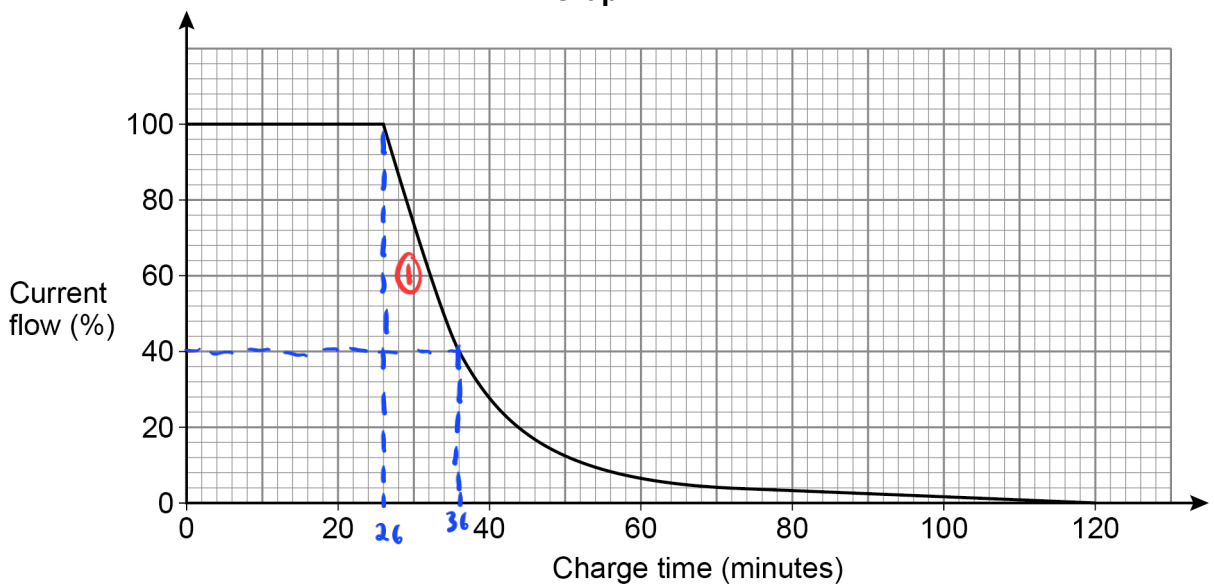
1 A mobile phone takes 2 hours to charge from empty.

When the phone is being charged, the current flow into the phone

- starts at full current flow (100%)
- continues at full current flow for a period of time
- gradually decreases until the phone is fully charged.

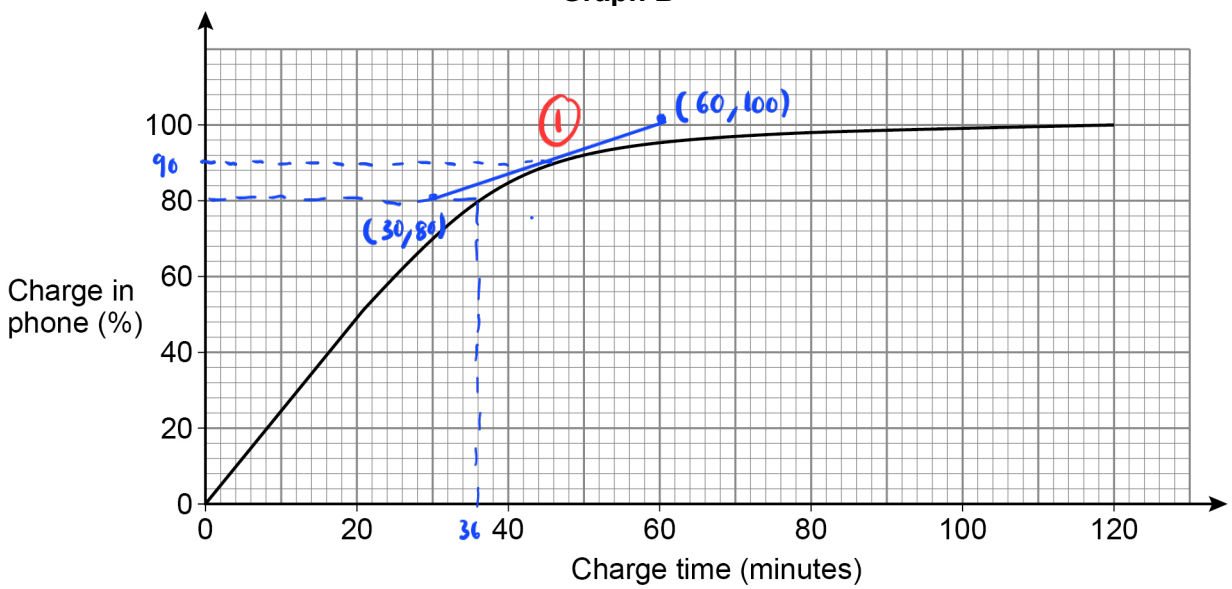
This is shown on **Graph A** below.

Graph A



Graph B shows the percentage charge in the phone when charging from empty.

Graph B



Megan's phone is empty of charge.

She starts to charge her phone at 10.00 am

1 (a) Using **Graph A**,

estimate the time when the current flow starts to decrease.

[2 marks]

10 am + 26 mins = 10.26 am

Answer 10.26 (1) am

1 (b) Using **Graph A and Graph B**,

estimate the percentage charge in the phone when the current flow is 40%

[1 mark]

Answer 80 (1) %

1 (c) Using **Graph B**,

estimate the rate of increase in the percentage charge when the phone has 90% charge.

[2 marks]

$\frac{100 - 80}{60 - 30} = \frac{20}{30} \times 100\% = 66.67\%$

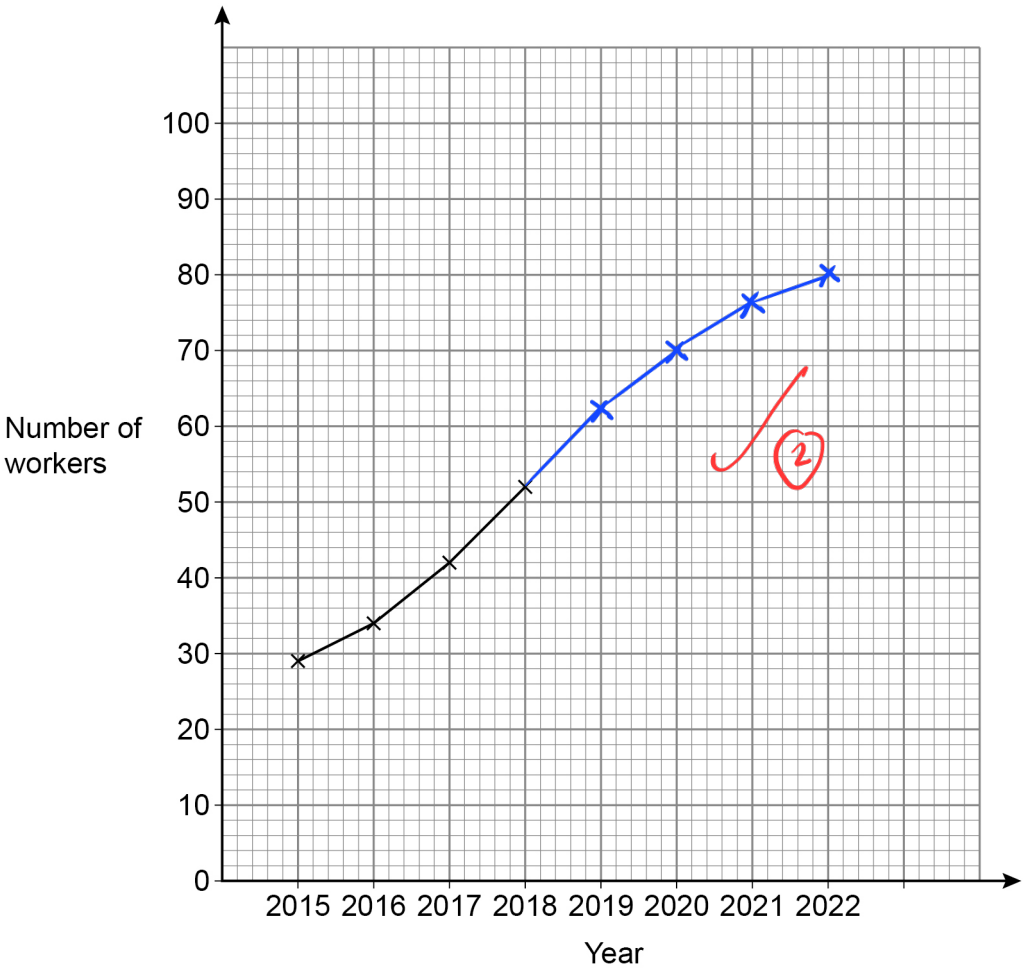
Answer 66.7 (1) percent per minute

2 The table shows the number of workers at a company in different years.

Year	2015	2016	2017	2018	2019	2020	2021	2022
Number of workers	29	34	42	52	62	70	76	80

A time-series graph is drawn to represent the data.

The first four points have been plotted.



2 (a) Complete the graph. **[2 marks]**

2 (b) Estimate the number of workers at the company in 2023 **[1 mark]**

Answer 82