

Mock Grade 6

Maths

Booklet 1

Paper 2H
Calculator

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1 Jean invests £15 000 in an account paying compound interest for 2 years.

In the first year the rate of interest is $x\%$

At the end of the first year the value of Jean's investment is £15 675

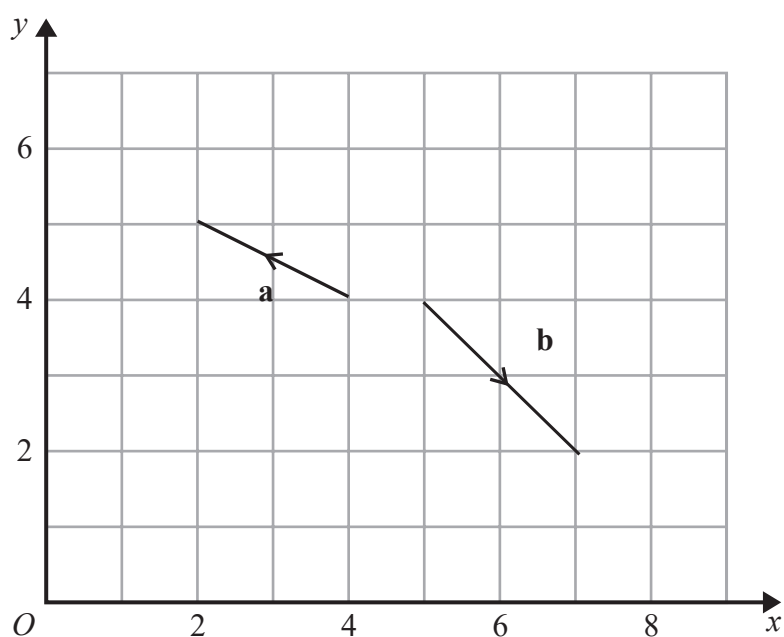
In the second year the rate of interest is $\frac{x}{3}\%$

What is the value of Jean's investment at the end of 2 years?

£.....

(Total for Question 1 is 4 marks)

2 The vector **a** and the vector **b** are shown on the grid.



(a) On the grid, draw and label vector $-2\mathbf{a}$

(1)

(b) Work out $2\mathbf{a} + 3\mathbf{b}$ as a column vector.

$\begin{pmatrix} \\ \text{---} \\ \end{pmatrix}$

(2)

(Total for Question 2 is 3 marks)

3 f and g are functions such that

$$f(x) = x^2 - 1 \quad \text{and} \quad g(x) = 4x^{-1}$$

(a) Find $f(-5)$

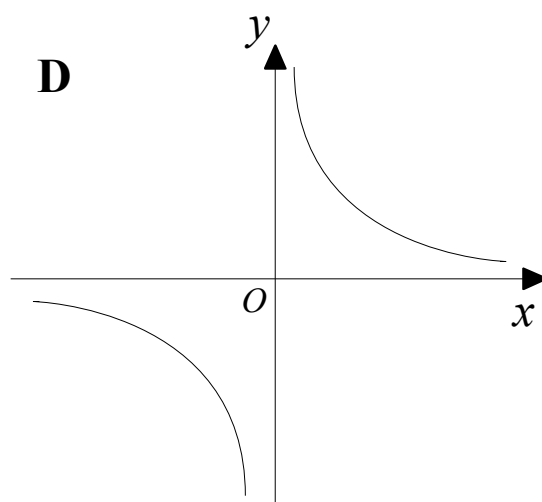
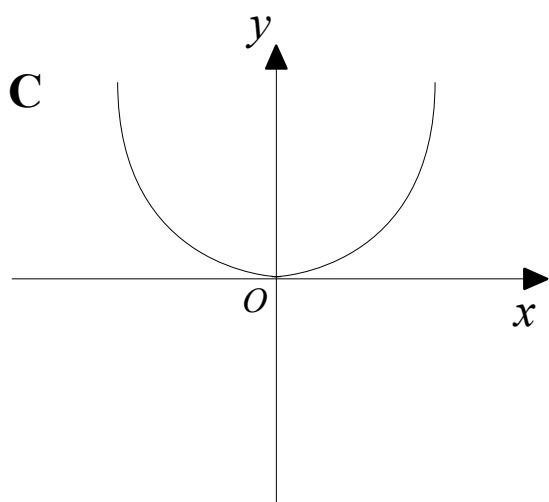
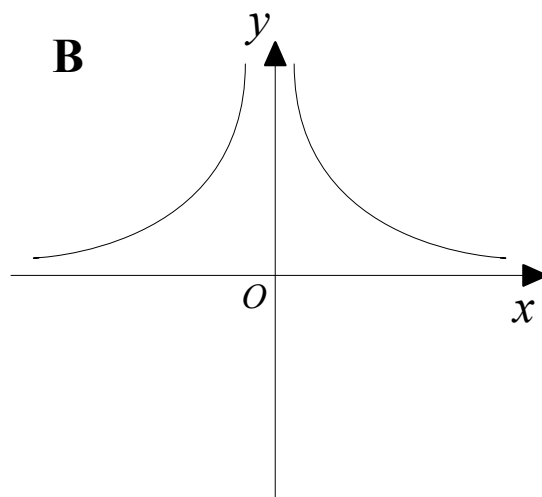
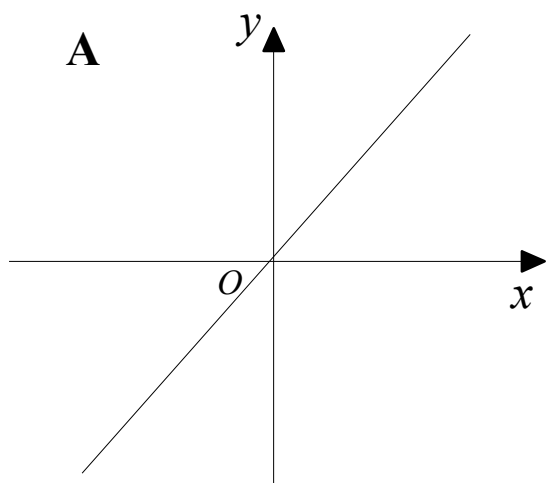
.....
(1)

(b) Find $fg(1)$

.....
(2)

(Total for Question 3 is 3 marks)

4 Here are four graphs.



Match each graph with a statement in the table below.

Proportionality relationship	Graph letter
y is directly proportional to x	
y is inversely proportional to x	
y is directly proportional to x^2	
y is inversely proportional to x^2	

(Total for question 4 is 2 marks)

5 The circumference of circle **B** is 120% of the circumference of circle **A**.

(a) Find the ratio of the area of circle **A** to the area of circle **B**.

.....
(2)

Square **E** has sides of length e cm.

Square **F** has sides of length f cm.

The area of square **E** is 21% greater than the area of square **F**.

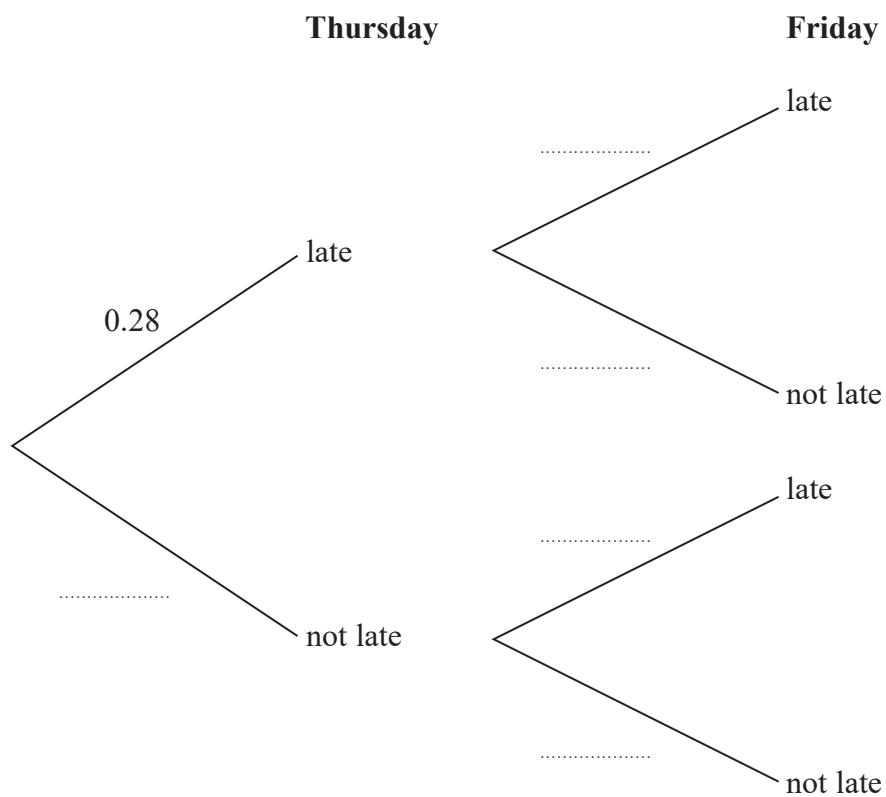
(b) Work out the ratio $e:f$

.....
(2)

(Total for Question 5 is 4 marks)

- 6 Mary travels to work by train every day.
The probability that her train will be late on any day is 0.28

(a) Complete the probability tree diagram for Thursday and Friday.



(2)

(b) Work out the probability that her train will be not late on at least one of these two days.

(3)

(Total for Question 6 is 5 marks)

- 7 The grouped frequency table gives information about the times, in minutes, that 80 office workers take to get to work.

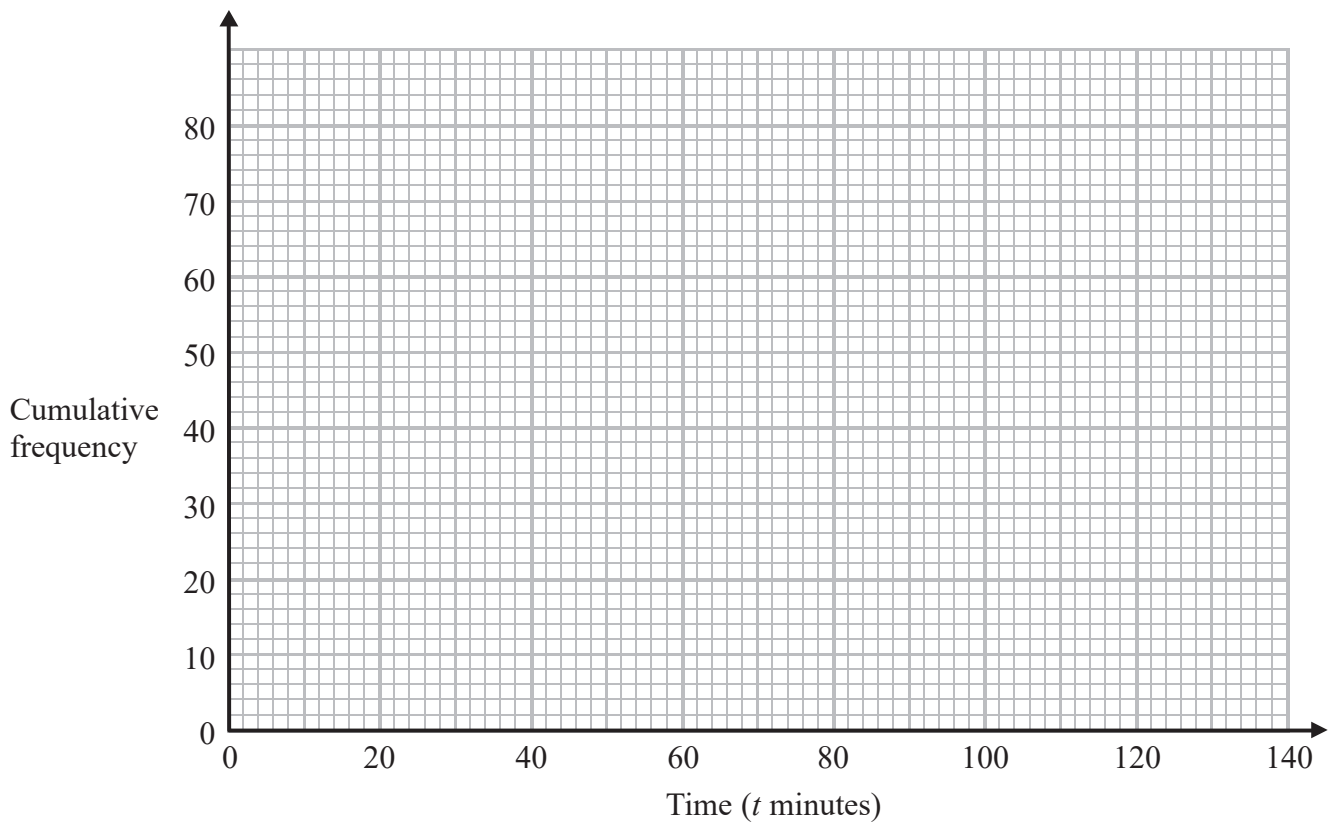
Time (t minutes)	Frequency
$0 < t \leq 20$	9
$20 < t \leq 40$	21
$40 < t \leq 60$	15
$60 < t \leq 80$	25
$80 < t \leq 100$	6
$100 < t \leq 120$	4

- (a) Complete the cumulative frequency table.

Time (t minutes)	Cumulative frequency
$0 < t \leq 20$	
$0 < t \leq 40$	
$0 < t \leq 60$	
$0 < t \leq 80$	
$0 < t \leq 100$	
$0 < t \leq 120$	

(1)

(b) On the grid, draw the cumulative frequency graph for this information.



(2)

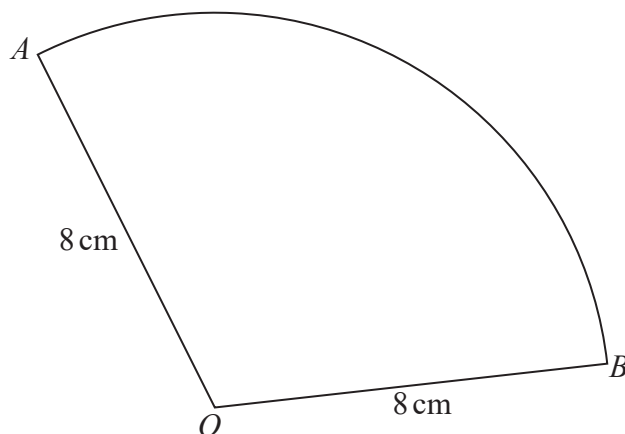
(c) Use your graph to find an estimate for the percentage of these office workers who take less than 50 minutes to get to work.

.....%

(3)

(Total for Question 7 is 6 marks)

- 8 OAB is a sector of a circle with centre O and radius 8 cm.



The area of the sector is 68 cm^2

Calculate the perimeter of the sector.

Give your answer correct to 2 significant figures.

..... cm

(Total for Question 8 is 4 marks)