

Write your name here

Surname

Other Names

Mathematics

**November 2018 Paper 1 (Non Calculator)
Part 1 (First half of the paper)
Edexcel Higher Tier**

Time: 45 minutes

Q	Topic	Max Mark	My Marks
1	Indices	2	
2	Substitution, Changing the Subject of a Formula	4	
3	Percentage of Amount, Percentage Change	5	
4	Inverse Proportion	3	
5	Proportion, Conversions	4	
6	Simultaneous Equations	3	
7	Area of a Circle, Sector	4	
8	Trigonometry SOHCAHTOA and Exact Values	3	
9	Cumulative Frequency and Box Plots	6	
10	Simplify Algebraic Fractions, Difference of Two Squares	3	
11	Proportion, Reverse Percentage	3	
	Total	40	

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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Work out the value of $\frac{3^7 \times 3^{-2}}{3^3}$

.....
(Total for Question 1 is 2 marks)

2 $v^2 = u^2 + 2as$

$u = 12 \quad a = -3 \quad s = 18$

(a) Work out a value of v .

.....
(2)

(b) Make s the subject of $v^2 = u^2 + 2as$

.....
(2)

(Total for Question 2 is 4 marks)

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- 3 A bonus of £2100 is shared by 10 people who work for a company.
40% of the bonus is shared equally between 3 managers.
The rest of the bonus is shared equally between 7 salesmen.

One of the salesmen says,

“If the bonus is shared equally between all 10 people I will get 25% more money.”

Is the salesman correct?

You must show how you get your answer.

(Total for Question 3 is 5 marks)



4 It would take 120 minutes to fill a swimming pool using water from 5 taps.

(a) How many minutes will it take to fill the pool if only 3 of the taps are used?

..... minutes
(2)

(b) State one assumption you made in working out your answer to part (a).

.....
.....
(1)

(Total for Question 4 is 3 marks)

5 A plane travels at a speed of 213 miles per hour.

(a) Work out an estimate for the number of seconds the plane takes to travel 1 mile.

..... seconds
(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

.....
.....
(1)

(Total for Question 5 is 4 marks)



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6 Solve the simultaneous equations

$$\begin{aligned}5x + y &= 21 \\ x - 3y &= 9\end{aligned}$$

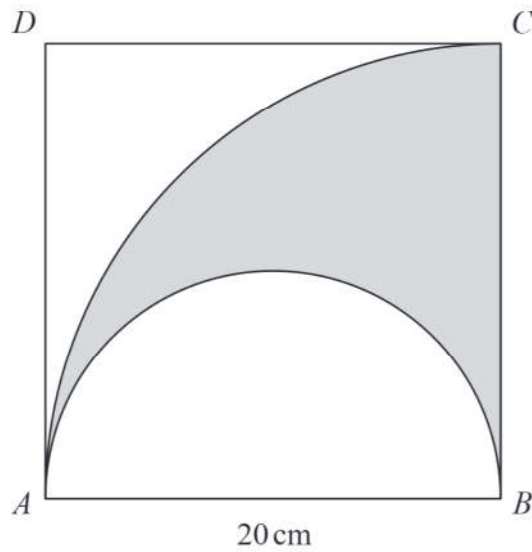
$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total for Question 6 is 3 marks)



- 7 The diagram shows a square $ABCD$ with sides of length 20 cm. It also shows a semicircle and an arc of a circle.



AB is the diameter of the semicircle.
 AC is an arc of a circle with centre B .

Show that $\frac{\text{area of shaded region}}{\text{area of square}} = \frac{\pi}{8}$

(Total for Question 7 is 4 marks)



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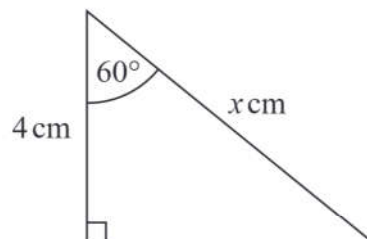
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8 (a) Write down the exact value of $\tan 45^\circ$

.....
(1)

Here is a right-angled triangle.



$\cos 60^\circ = 0.5$

(b) Work out the value of x .

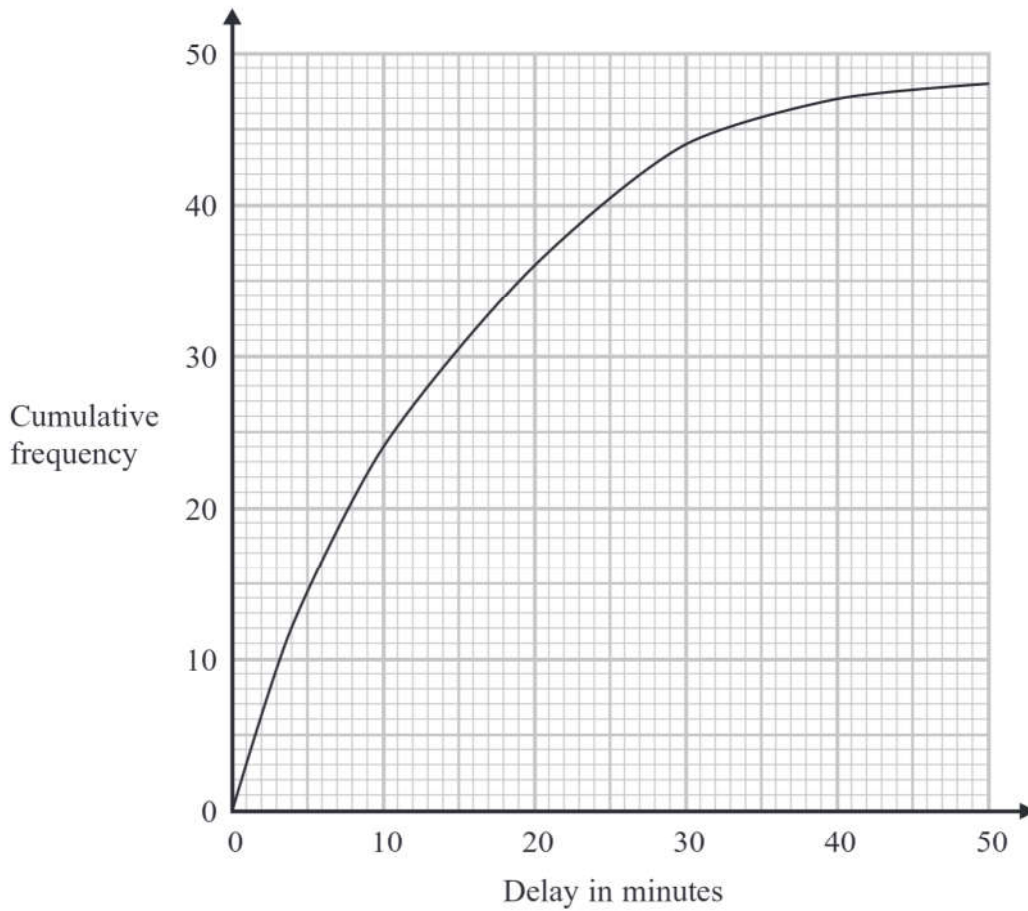
.....
(2)

(Total for Question 8 is 3 marks)



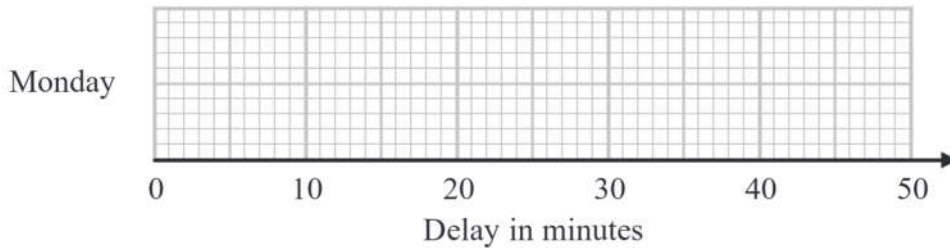
- 9 The times that 48 trains left a station on Monday were recorded.

The cumulative frequency graph gives information about the numbers of minutes the trains were delayed, correct to the nearest minute.



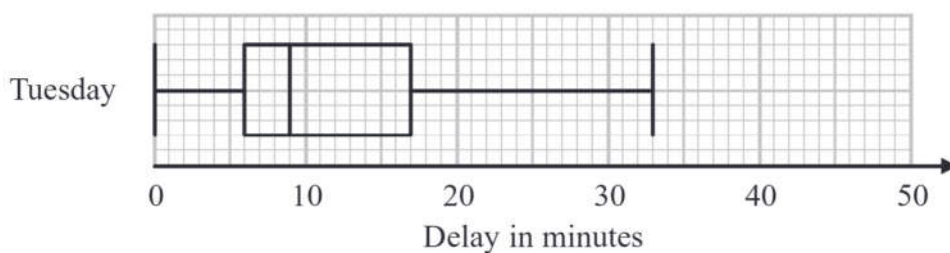
The shortest delay was 0 minutes.
The longest delay was 42 minutes.

- (a) On the grid below, draw a box plot for the information about the delays on Monday.



(3)

48 trains left the station on Tuesday.
The box plot below gives information about the delays on Tuesday.



- (b) Compare the distribution of the delays on Monday with the distribution of the delays on Tuesday.

.....
.....
.....
.....
(2)

Mary says,

“The longest delay on Tuesday was 33 minutes.
This means that there must be some delays of between 25 minutes and 30 minutes.”

- (c) Is Mary right?
You must give a reason for your answer.

.....
.....
(1)

(Total for Question 9 is 6 marks)

10 (a) Simplify $\frac{x-1}{5(x-1)^2}$

.....
(1)

(b) Factorise fully $50 - 2y^2$

.....
(2)

(Total for Question 10 is 3 marks)



11 Jack and Sadia work for a company that sells boxes of breakfast cereal.

The company wants to have a special offer.

Here is Jack's idea for the special offer.

Put 25% more cereal into each box and do **not** change the price.

Here is Sadia's idea.

Reduce the price and do **not** change the amount of cereal in each box.

Sadia wants her idea to give the same value for money as Jack's idea.

By what percentage does she need to reduce the price?

..... %

(Total for Question 11 is 3 marks)

