

**GCSE (9-1) Mathematics**  
**J560/05** Paper 5 (Higher Tier)

**Question Set 6**

1. Write 75 as a product of its prime factors.

..... [2]

- 2, (a) The ratio 45 minutes to 3 hours 45 minutes can be written in the form  $1 : n$ .

Find the value of  $n$ .

(a)  $n = \dots\dots\dots$  [2]

- (b) Reece and Sarah share some money in the ratio  $9 : 16$ .

Reece says that Sarah gets more than 60% of this money.

Show that Reece is correct.

$\dots\dots\dots$  [3]

3. Charlie and Jasmine share cartons of apple juice.

Charlie drinks  $\frac{1}{3}$  of a carton every day.

Jasmine drinks  $\frac{2}{5}$  of a carton every day.

Any apple juice left in a carton at the end of the day is used the following day.

The cost of a carton is 70p.

Charlie and Jasmine buy just enough cartons to last them for 10 days.

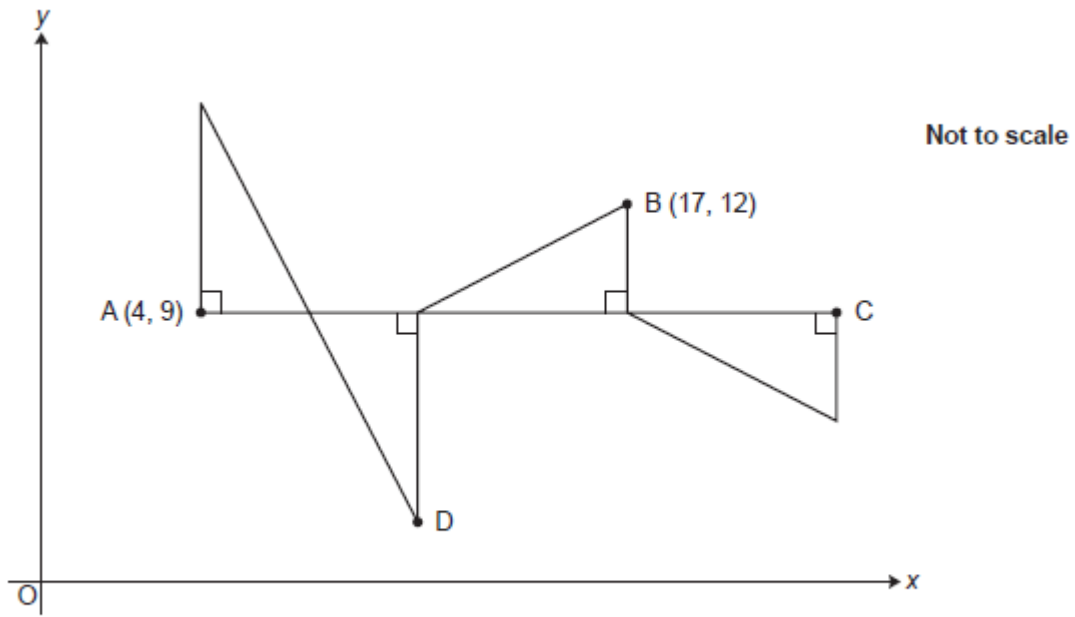
How much do they spend in total for these cartons?

Give your answer in £.

Show your working.

£ ..... [6]

4. A pattern is made from four congruent right-angled triangles.



The line AC is parallel to the  $x$ -axis.  
The point A has coordinates (4, 9) and the point B has coordinates (17, 12).

Work out the coordinates of point C and point D.

C (..... , .....) )

D (..... , .....) ) [5]

5. Each day, Eve records how long it takes her to complete a puzzle.

On Friday, she took 50% less time than on Thursday.

On Saturday, she took 20% less time than on Friday.

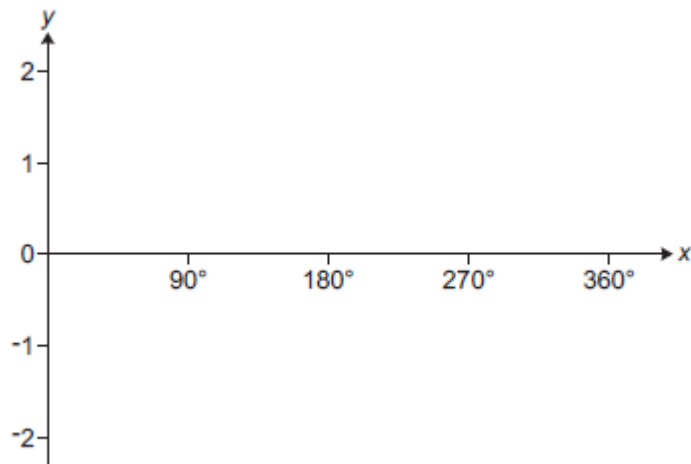
On Saturday, she takes 36 minutes to complete the puzzle.

How many minutes did she take to complete the puzzle on Thursday?

Show your working.

..... minutes **[5]**

6. (a) Sketch the graph of  $y = \sin x$  for  $0^\circ \leq x \leq 360^\circ$ .



[2]

- (b) The graph of  $y = \cos(x - 30)$  for  $0^\circ \leq x \leq 360^\circ$  crosses the  $x$ -axis in two places.

Write down the values of  $x$  where this occurs.

$x = \dots\dots\dots$  and  $\dots\dots\dots$  [2]

7. Solve.

$$\frac{x}{x+6} = 5$$

$x = \dots\dots\dots$  [3]

8.

(a) The masses,  $m$ kg, of some parcels are shown below.

4 15 14 11 12 3 1 18 13 2 16 10

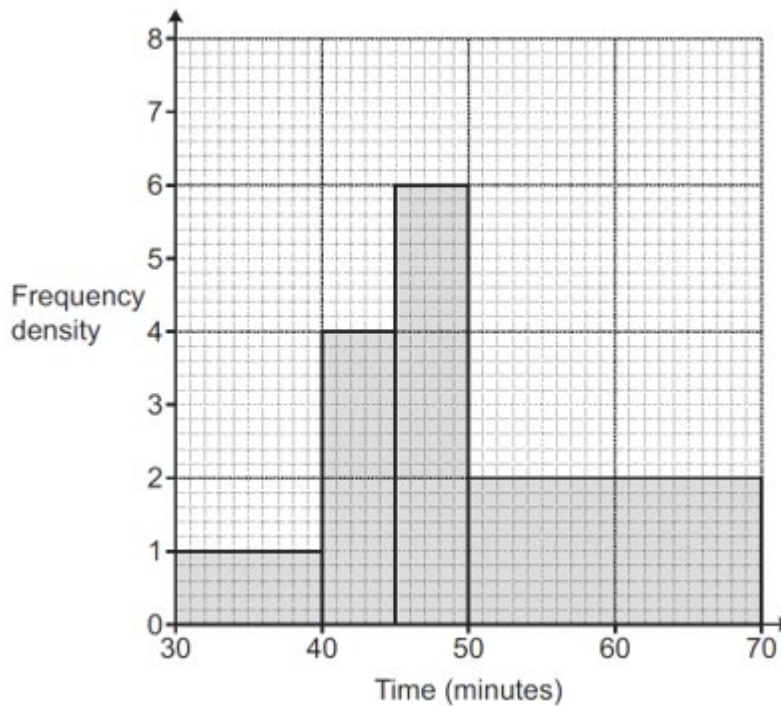
Jack constructs this grouped frequency table to record the masses.

Mass ( $m$ kg)	Tally	Frequency
$0 < m < 5$		
$5 < m < 10$		
$10 < m < 15$		
$15 < m < 20$		

Explain why Jack's table is unsuitable to record the masses.

.....  
 ..... [1]

(b) The histogram summarises the times taken, in minutes, by some students to complete a race.



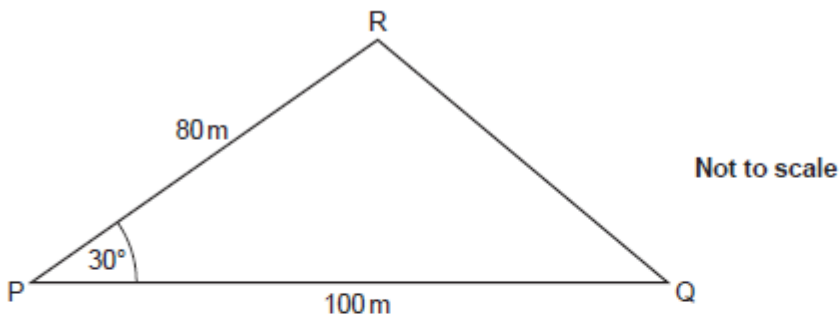
(i) Show that 70 students took between 45 and 70 minutes to complete the race. [2]

(ii) Calculate an estimate of the mean time taken to complete the race. Show your working.

(b)(ii) .....min [5]



9. The diagram shows a triangular field PQR which is used to grow organic carrots.



$PQ = 100\text{ m}$ ,  $PR = 80\text{ m}$  and angle  $RPQ = 30^\circ$ .

In recent years, an average of 2.5 kg of carrots has been harvested from each square metre of the field.

- (a) Use this information to work out the total mass of carrots that might have been harvested from the field in 2019.

(a) .....kg [4]

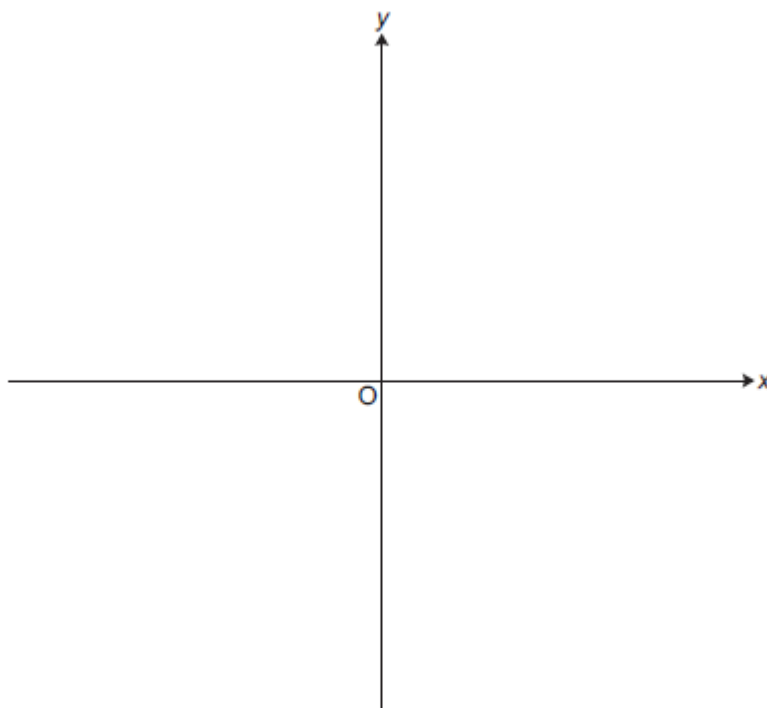
- (b) Why might the answer to part (a) be unreliable?

.....  
..... [1]

10. (a) Write  $x^2 - 10x + 22$  in the form  $(x - a)^2 - b$ .

(a) ..... [3]

(b) Sketch the graph of  $y = x^2 - 10x + 22$ .  
Show clearly the coordinates of any turning points and the value of the y-intercept.



[4]

**Total Marks for Question Set 6: 50**

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