



Name: .....

Video Solutions:



## MATHS FOR GRANTED EASTER GCSE MOCK EXAMINATIONS

### PAPER 3 (Calculator) Higher Tier Time: 1 hour 30 minutes

**You must have:** Ruler, protractor, pair of compasses, pen, HB pencil, eraser, calculator

#### Instructions

Use **black** ink or ball-point pen.

**Fill in your name** at the top of this page.

Answer **all** questions.

Answer the questions in the spaces provided.

**Calculators MAY be used.**

Diagrams are **NOT** accurately drawn, unless otherwise indicated.

You must **show all your working out.**

#### Information

The total mark for this paper is 80.

The marks for **each** question are shown in brackets.

#### Advice

Read each question carefully and try to answer every question.

Keep an eye on the time and check your answers, if you have time, at the end.

**Q1.**

$a = -5$   
 $c = -2$

(a) Work out the value of  $2a^2 + 6c$

.....  
(2)

There are 4 pens in a small box of pens.  
There are 10 pens in a large box of pens.

Ami buys  $x$  small boxes of pens and  $y$  large boxes of pens.  
She buys a total of  $T$  pens.

(b) Write down a formula for  $T$  in terms of  $x$  and  $y$ .

.....  
(3)

**(Total for question = 5 marks)**

**Q2.**

Express 42 minutes as a percentage of 5 hours.

..... %

**(Total for question = 3 marks)**

**Q3.**

In a sale, normal prices are reduced by 35%  
The normal price of a bed is \$1200

Work out the sale price of the bed.

\$ .....

**(Total for question = 3 marks)**

**Q4.**

$ABCD$  is a parallelogram.

$$\vec{BC} = \begin{pmatrix} 5 \\ -1 \end{pmatrix} \quad \vec{DC} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$$

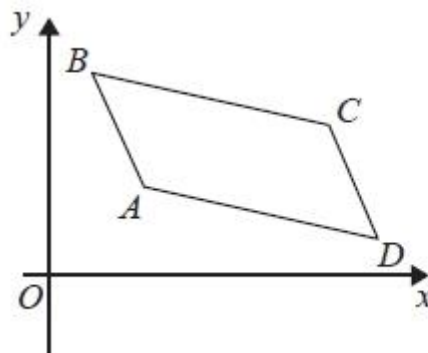


Diagram NOT  
accurately drawn

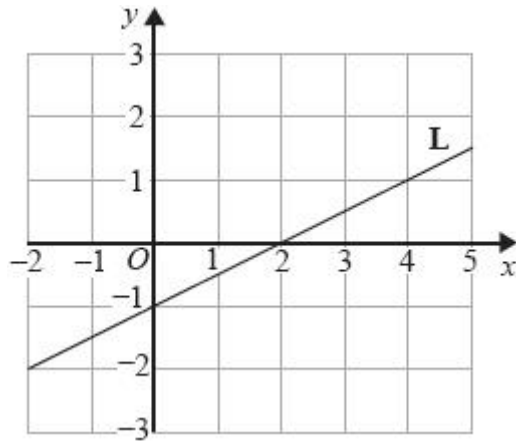
Find  $\vec{BD}$  as a column vector.

$\begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$

**(Total for question = 2 marks)**

**Q5.**

The straight line **L** is shown on the grid.



(a) Find an equation of **L**.

.....  
(2)

(b) Find an equation of the line that is parallel to **L** and passes through the point (5, 4)

.....  
(2)

**(Total for question = 4 marks)**

**Q6.**

The diagram shows a quadrilateral  $ABCD$ .

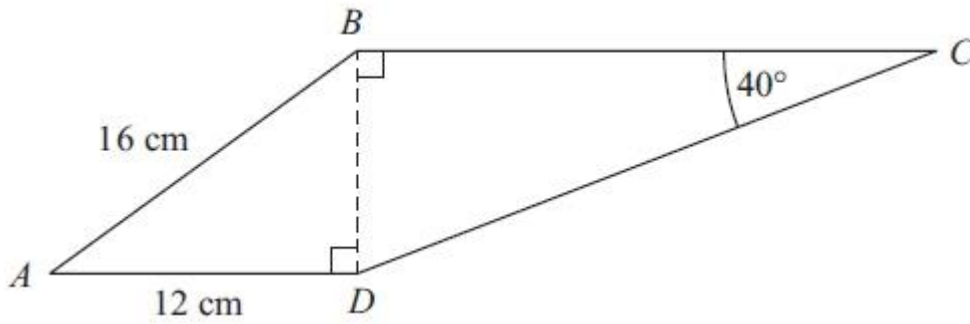


Diagram **NOT** accurately

drawn

$AB = 16\text{ cm}$ .

$AD = 12\text{ cm}$ .

Angle  $BCD = 40^\circ$ .

Angle  $ADB = \text{angle } CBD = 90^\circ$ .

Calculate the length of  $CD$ .

Give your answer correct to 3 significant figures.

..... cm

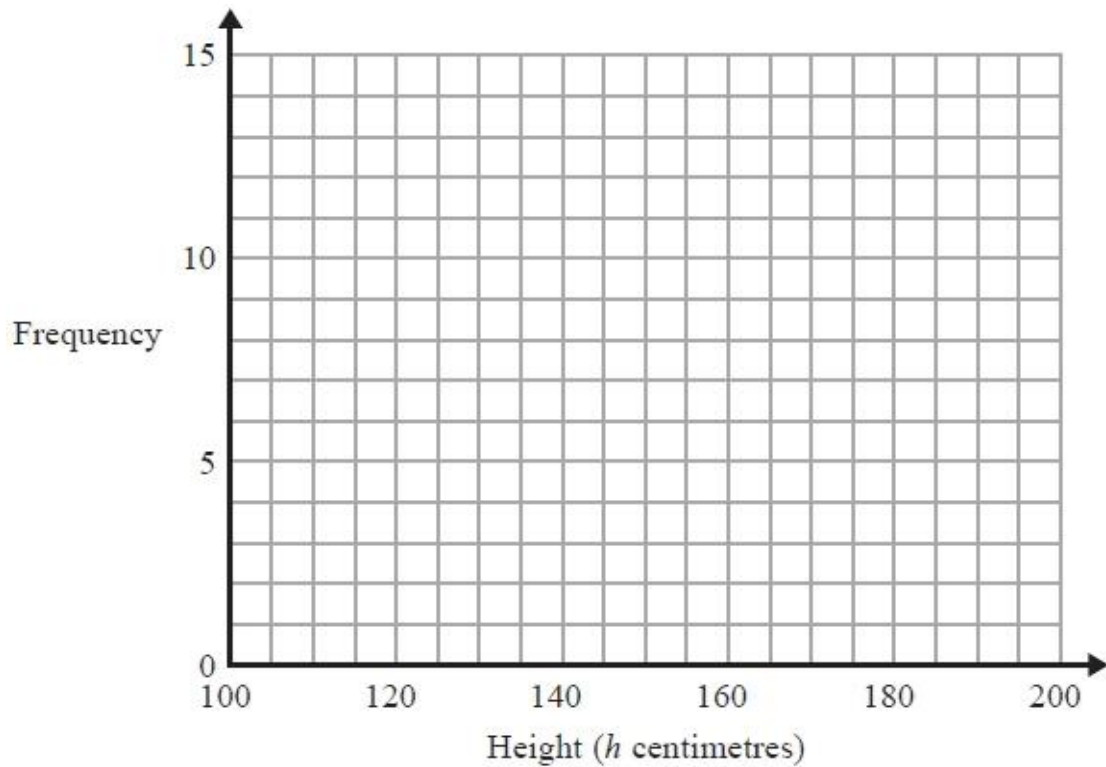
**(Total for Question is 5 marks)**

**Q7.**

The table shows information about the heights, in centimetres, of 30 sunflower plants.

Height ( $h$ centimetres)	Frequency
$100 < h \leq 120$	2
$120 < h \leq 140$	6
$140 < h \leq 160$	7
$160 < h \leq 180$	12
$180 < h \leq 200$	3

(a) On the grid, draw a frequency polygon for this information.



(2)

(b) Write down the modal class interval.

.....

(1)

**(Total for question = 3 marks)**

**Q8.**

A car travels a distance of 63.5 km, correct to the nearest 0.5 km.  
The car takes 45.8 minutes correct to 1 decimal place.

Work out the lower bound for the average speed of the car.  
Show your working clearly.  
Give your answer in km/h correct to 1 decimal place.

..... km/h

**(Total for question = 4 marks)**

**Q9.**

An approximate solution to an equation is found using this iterative process:

$$X_{n+1} = [(x_n)^3 - 3] / 8 \text{ and } x_1 = -1$$

a) Work out the values of  $x_2$  and  $x_3$

$x_2 = \dots\dots\dots$  (1)

$x_3 = \dots\dots\dots$  (1)

b) Work out the solution to 6 decimal places.

..... (1)

**(Total for question = 3 marks)**

**Q10.**

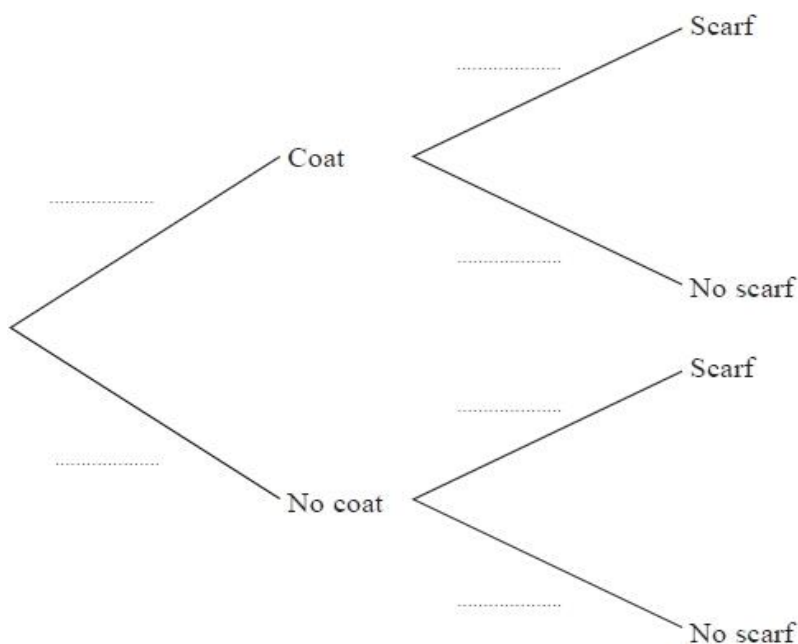
When Joe goes to school in winter, the probability that he wears a coat is  $\frac{5}{8}$

If he wears a coat, the probability that he wears a scarf is  $\frac{1}{4}$

If he does not wear a coat, the probability that he wears a scarf is  $\frac{1}{6}$

(a) Complete the probability tree diagram.

(3)



On a day Joe goes to school in winter, calculate the probability that:

(b) he is not wearing a coat and is not wearing a scarf,

.....

(2)

(c) he is wearing a coat or he is wearing a scarf but he is not wearing both a coat and a scarf.

.....

(2)

**(Total for question = 7 marks)**



**Q11.**

The diagram shows a triangular prism  $ABCDEF$  with a horizontal base  $ABEF$ .

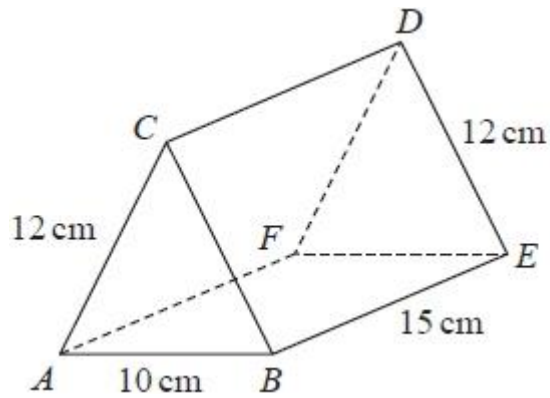


Diagram **NOT**  
accurately drawn

$AC = BC = FD = ED = 12 \text{ cm}$        $AB = 10 \text{ cm}$        $BE = 15 \text{ cm}$

Calculate the size of the angle between  $AD$  and the base  $ABEF$ .  
Give your answer correct to 3 significant figures.

.....°

**(Total for question = 4 marks)**

**Q12.**

Chao bought a boat for HK\$160 000  
The value of the boat depreciates by 4% each year.

(a) Work out the value of the boat at the end of 3 years.

Give your answer correct to the nearest HK\$.

HK\$ .....  
(3)

Jalina gets a salary increase of 5%  
Her salary after the increase is HK\$252 000

(b) Work out Jalina's salary before the increase.

HK\$ .....  
(3)

**(Total for question = 6 marks)**

**Q13.**

In the state of Utopia, the alphabet contains 25 letters.  
A car registration number consists of two **different** letters of the alphabet followed by an integer  $n$  such that  $100 \leq n \leq 999$ .

Find the number of possible car registration numbers in Utopia.

.....  
**(Total for question = 3 marks)**

Q14.

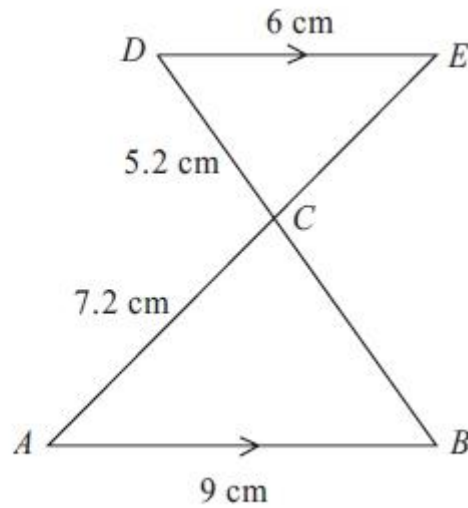


Diagram **NOT** accurately drawn

- $AB$  is parallel to  $DE$ .  
 $ACE$  and  $BCD$  are straight lines.  
 $AB = 9$  cm.  
 $AC = 7.2$  cm.  
 $CD = 5.2$  cm.  
 $DE = 6$  cm.  
(a) Calculate the length of  $BC$ .

..... cm  
(2)

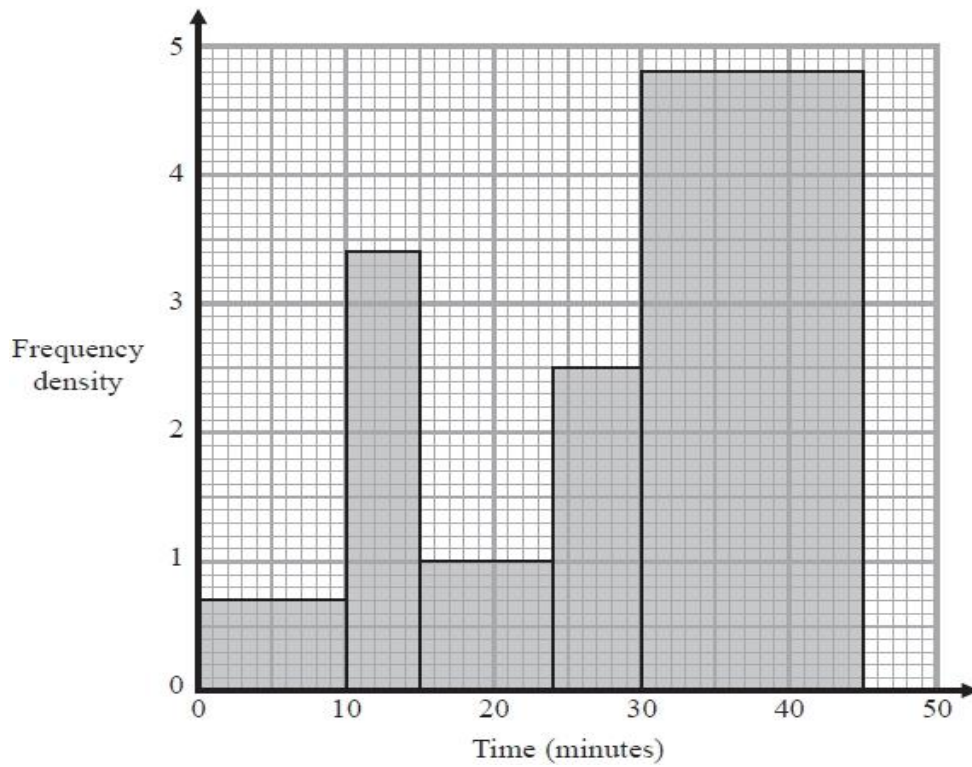
- (b) Calculate the length of  $CE$ .

..... cm  
(2)

**(Total for question = 4 marks)**

**Q15.**

The histogram gives information about the times, in minutes, that some customers spent in a supermarket.



(a) Work out an estimate for the proportion of these customers who spent between 17 minutes and 35 minutes in the supermarket.

.....  
(3)

One of the customers is selected at random.

Given that this customer had spent more than 30 minutes in the supermarket,

(b) find the probability that this customer spent more than 36 minutes in the supermarket.

.....  
(2)

**(Total for question = 5 marks)**

**Q16.**

The equation of the line **L** is  $y = 9 - x$

The equation of the curve **C** is  $x^2 - 3xy + 2y^2 = 0$

**L** and **C** intersect at two points.

Find the coordinates of these two points.

Show clear algebraic working.

( ..... , ..... ) and ( ..... , ..... )

**(Total for question = 5 marks)**

**Q17.**

$$\frac{3}{(x+2)} + \frac{4}{(x-3)} = 2$$

Solve the equation

Show clear algebraic working.

.....  
**(Total for Question is 5 marks)**

Q18.

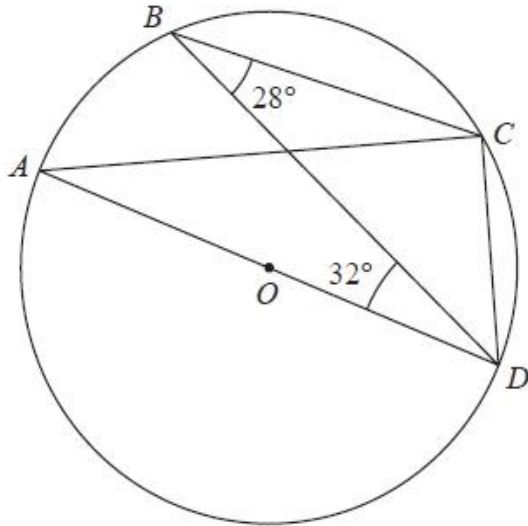


Diagram **NOT**  
accurately drawn

$A$ ,  $B$ ,  $C$  and  $D$  are points on a circle, centre  $O$ .  
 $AOD$  is a diameter of the circle.

Angle  $CBD = 28^\circ$   
Angle  $BDA = 32^\circ$

Find the size of angle  $BDC$ .  
Give a reason for each stage of your working.

.....<sup>o</sup>  
(Total for question = 4 marks)

**Q19.**

In a region of a country, two types of eagle, type *A* and type *B*, can be found.

In 2003 the ratio of the number of type *A* eagles to the number of type *B* eagles was 2 : 5

In 2015 the ratio of the number of type *A* eagles to the number of type *B* eagles was 4 : 3

From 2003 to 2015, the number of type *A* eagles had increased by 16

From 2003 to 2015, the number of type *B* eagles had decreased by 107

Calculate the number of type *B* eagles in this region in 2015

.....

**(Total for question = 5 marks)**

**TOTAL FOR PAPER IS 80 MARKS**