Name: …………………….............................   **Video Solutions:**

MATHS FOR GRANTED
EASTER GCSE MOCK EXAMINATIONS

PAPER 2 (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) Factorise fully $10ab - 24a^2$

....

(2)

(b) Factorise $p^2 + 10p - 24$

....

(2)

(Total for question = 4 marks)

Q2.

Find an equation of the straight line that passes through the points with co-ordinates (1, 4) and (−2, −5).

....

(Total for question = 3 marks)

Q3.

15 students took an English test.
The same 15 students took a Maths test.
Both tests were marked out of 30

For the English test results

the median was 21
the interquartile range was 14

The Maths test results are shown below.

18   18   19   20   24   25   25   26   28   28   29   29   29   30   30

Use the information above to compare the English test results with the Maths test results.
Write down **two** comparisons.

1 ....

....

2 ....

....

(Total for question = 4 marks)

Q4.

The weekly rent for a holiday apartment is £530, which is the same as 715.5 euros.
The weekly rent for a holiday cottage is £750

Using the same rate of currency exchange, work out the weekly rent for the cottage in euros.

.... euros

(Total for question = 3 marks)

Q5.

Toga wants to estimate the number of termites in a nest.

On Monday Toga catches 80 termites.
He puts a mark on each termite.
He then puts all 80 termites back in the nest.

On Tuesday Toga catches 60 termites.
12 of these termites have a mark on them.

Work out an estimate for the total number of termites in the nest.
You must write down any assumptions you have made.

....

(Total for question = 4 marks)

Q6.

A number, *y*, is rounded to 2 significant figures.

The result is 0.46

Write down the error interval for *y*.

....

(Total for question = 2 marks)

Q7.

A particle moves from rest.
The speed of the particle is v m/s when it has moved a distance of x metres.

v is proportional to $\sqrt{x}$

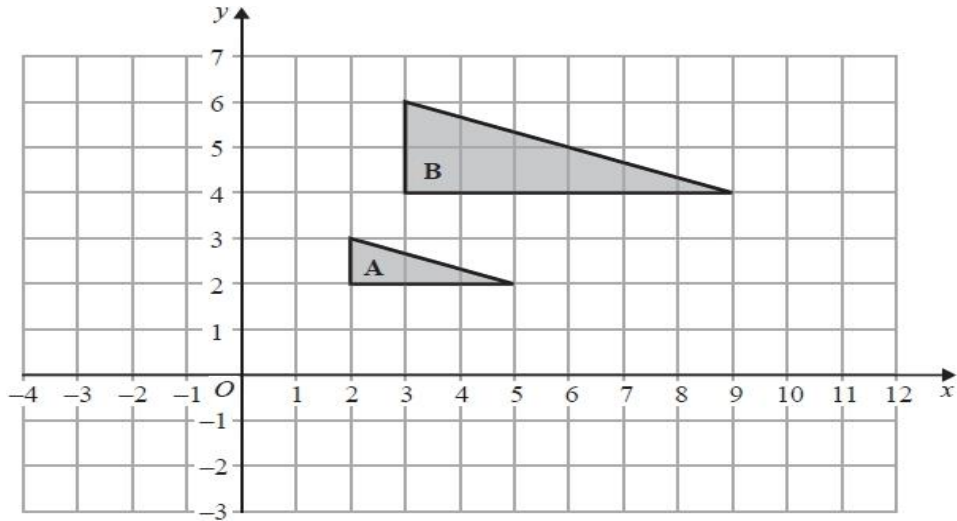When $v = 8$, $x = 25$

  (a) Express v in terms of x.

....

(3)

  (b) Find the speed of the object when it has moved a distance of 56.25 metres.

.... m/s

(2)

(Total for Question is 5 marks)

Q8.

(a) Describe fully the single transformation that maps triangle **A** onto triangle **B**.

....

....

(3)

(b) On the grid, translate triangle **A** by the vector $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$

Label the new shape **C**.

(1)
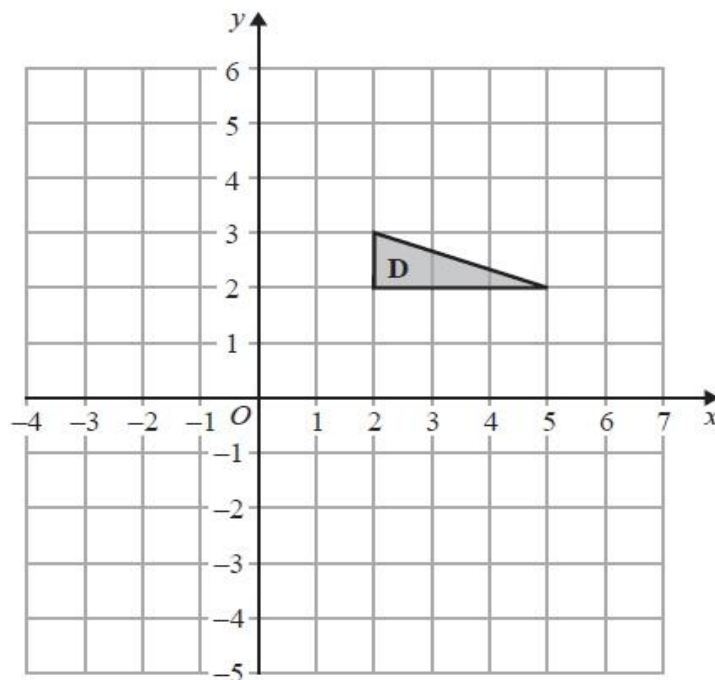
(c) On the grid, rotate triangle **D** 90° anticlockwise with centre (3, 1)

(2)

(Total for question = 6 marks)

Q9.

Each student in a group of 32 students was asked the following question.

"Do you have a desktop computer (*D*), a laptop (*L*) or a tablet (*T*)?"

Their answers showed that

19 students have a desktop computer
17 students have a laptop
16 students have a tablet
9 students have both a desktop computer and a laptop
11 students have both a desktop computer and a tablet
7 students have both a laptop and a tablet
5 students have all three.

(a) Using this information, complete the Venn diagram to show the number of students in each appropriate subset.
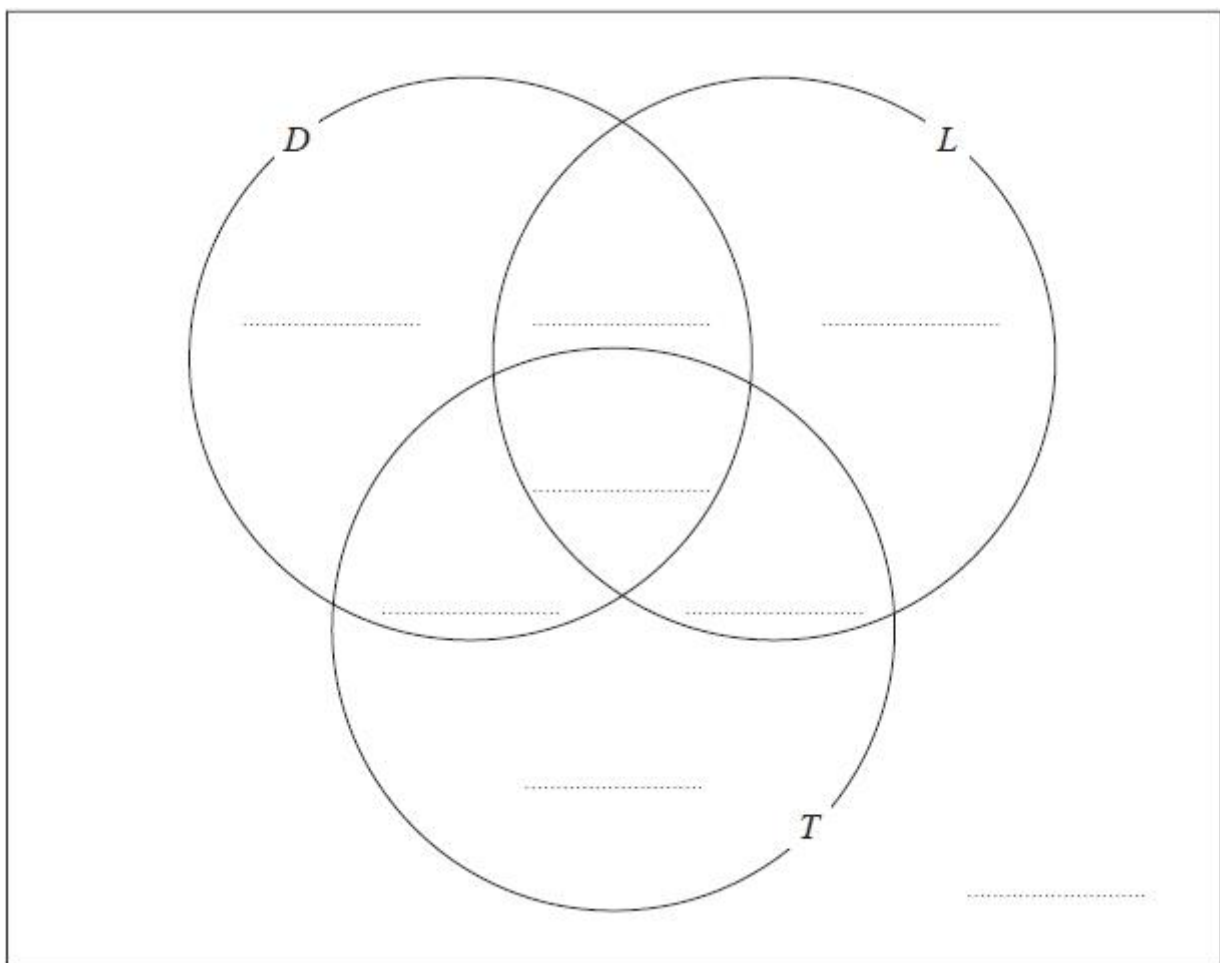
(3)

One of the students with both a desktop computer and a laptop is chosen at random.

(b) Find the probability that this student also has a tablet.

....

(1)

(Total for question = 4 marks)

Q10.

Given that $a : b = 3 : 5$ and that $a : c = 7 : 4$

find $a : b : c$
Give your answer in its simplest form.

$a : b : c =$ ....

(Total for question = 2 marks)

Q11.

The function g is such that $g(x) = \dfrac{12}{x - 3}$

The function h is such that $h(x) = x^2 + 4$

(a) Find h(-9)

....
(1)

(b) Find hg(5)

....
(2)

(c) Find $g^{-1}(x)$

....
(2)

(Total for question = 5 marks)

Q12.

The value of a van depreciates at the rate of 20% per year.
Gary buys a new van for £27 500
After *n* years the value of the van is £11 264
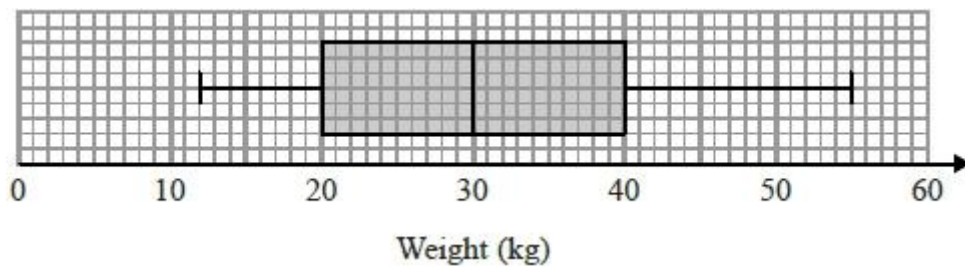
Find the value of *n*.

....

(Total for Question is 2 marks)

Q13.

The table shows some information about the weights, in kg, of some boxes.

Minimum	Lower Quartile	Median	Upper Quartile	Range
12	20	32	40	55

Yusuf uses this information to draw the box plot below.

Weight (kg)

Write down two things wrong with this box plot.

1 ....

....

2 ....

....

(Total for question = 2 marks)

Q14.

The diagram shows a metal plate.

B

Diagram **NOT** *accurately drawn*

65°

35°

A   8 cm   O   C
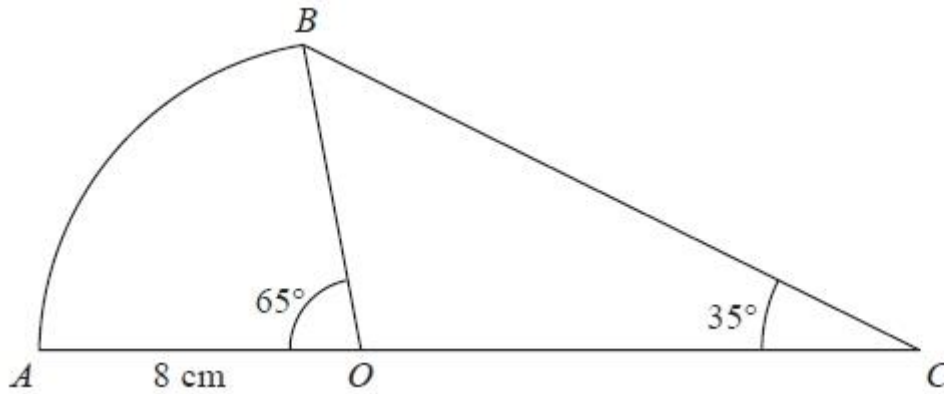
The metal plate is made from a sector *OAB* of a circle, centre *O*, and a triangle *OCB*.

Angle *AOB* = 65° Angle *OCB* = 35°
OA = *OB* = 8 cm.
AOC is a straight line.

(a)   Calculate the length of *BC*.
Give your answer correct to 3 significant figures.

.... cm

(3)

(b)   Calculate the total area of the metal plate.
Give your answer correct to 3 significant figures.

.... cm²

(4)

(Total for Question is 7 marks)

Q15.

(a) Solve $x^2 + 2x > 6x + 5$

....

(3)

(b) Represent your solution set to part (a) on the number line below.

(1)
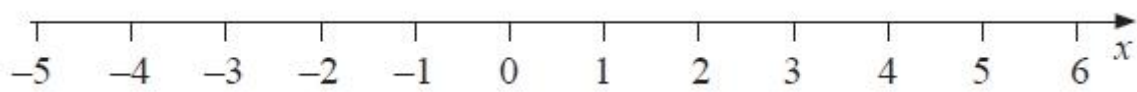
(Total for question = 4 marks)

Q16.

A curve has equation $y = f(x)$

The coordinates of the minimum point on this curve are (–9, 15)

(a) Write down the coordinates of the minimum point on the curve with equation
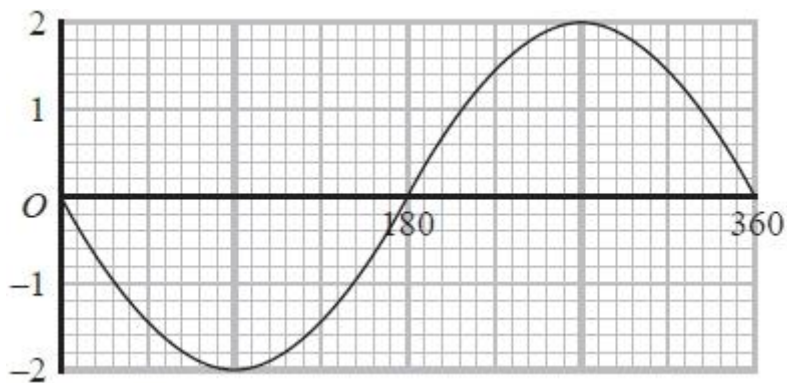
    (i) $y = f(x + 3)$

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

    (ii) $y = - f(x)$

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

(2)

The graph of $y = a \cos (x + b)°$ for $0 \le x \le 360$ is drawn on the grid below.

Given that $a > 0$ and that $0 < b < 360$

(b) find the value of a and the value of b.

$a = $ ....

$b = $ ....

(2)

(Total for question = 4 marks)

Q17.

V is inversely proportional to the square of *t*

V = 28 when *t* = 2.5

    (a) Express *V* in terms of *t*

....
    (3)

(b) Work out the value of *V* when *t* = 6.25

V = ...
    (2)

(Total for question = 5 marks)

Q18.

Use your calculator to work out:

$$\frac{12.74 + \sqrt{9.5}}{6.04 \; X \; 4.1}$$

Write down all the figures on your calculator display

....

(Total for question = 2 marks)

Q19.

The sides of triangle *PQR* are tangents to a circle.
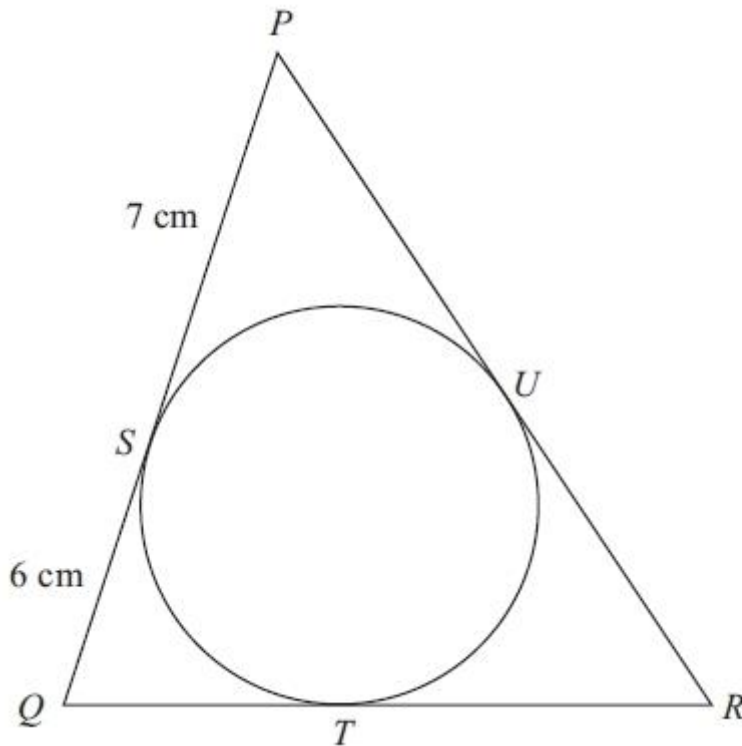The tangents touch the circle at the points *S*, *T* and *U*.
QS = 6 cm. *PS* = 7 cm.

Diagram **NOT** accurately drawn

(a) (i) Write down the length of *QT*.

...............................cm

(ii) Give a reason for your answer.

....

(2)
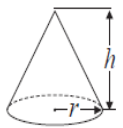
The perimeter of triangle *PQR* is 42 cm.

(b) Calculate the size of angle *PQR*.
Give your answer correct to 1 decimal place.

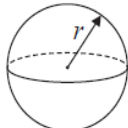...°

(4)

(Total for question = 6 marks)
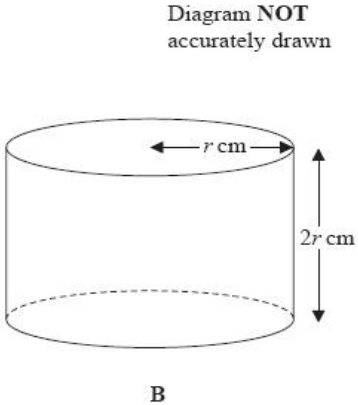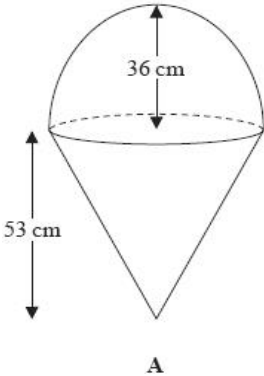
Volume of cone = $\frac{1}{3}\pi r^2 h$

Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

Q20.

The diagram shows two solid shapes, shape **A** and shape **B**.
Shape **A** is made of a hemisphere and a cone.
Shape **B** is a cylinder.

Diagram **NOT**
accurately drawn

36 cm

53 cm

A

r cm

2*r* cm

B

For shape **A**

   radius of the hemisphere is 36 cm
   radius of the base of the cone is 36 cm
   height of the cone is 53 cm

For shape **B**

   radius of the cylinder is *r* cm
   height of the cylinder is 2*r* cm

The volume of shape **A** = the volume of shape **B**

Calculate the height of shape **B**.

.... cm

(Total for question = 6 marks)

TOTAL FOR PAPER IS 80 MARKS