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

MATHS FOR GRANTED
EASTER GCSE MOCK EXAMINATIONS

PAPER 1 (Non-Calculator)
Higher Tier
Time: 1 hour 30 minutes

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

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 not 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.

Show that $3\frac{1}{5} \div 2\frac{2}{3} = 1\frac{1}{5}$

(Total for question = 3 marks)

Q2.

(a) Write 224 as a product of powers of its prime factors.
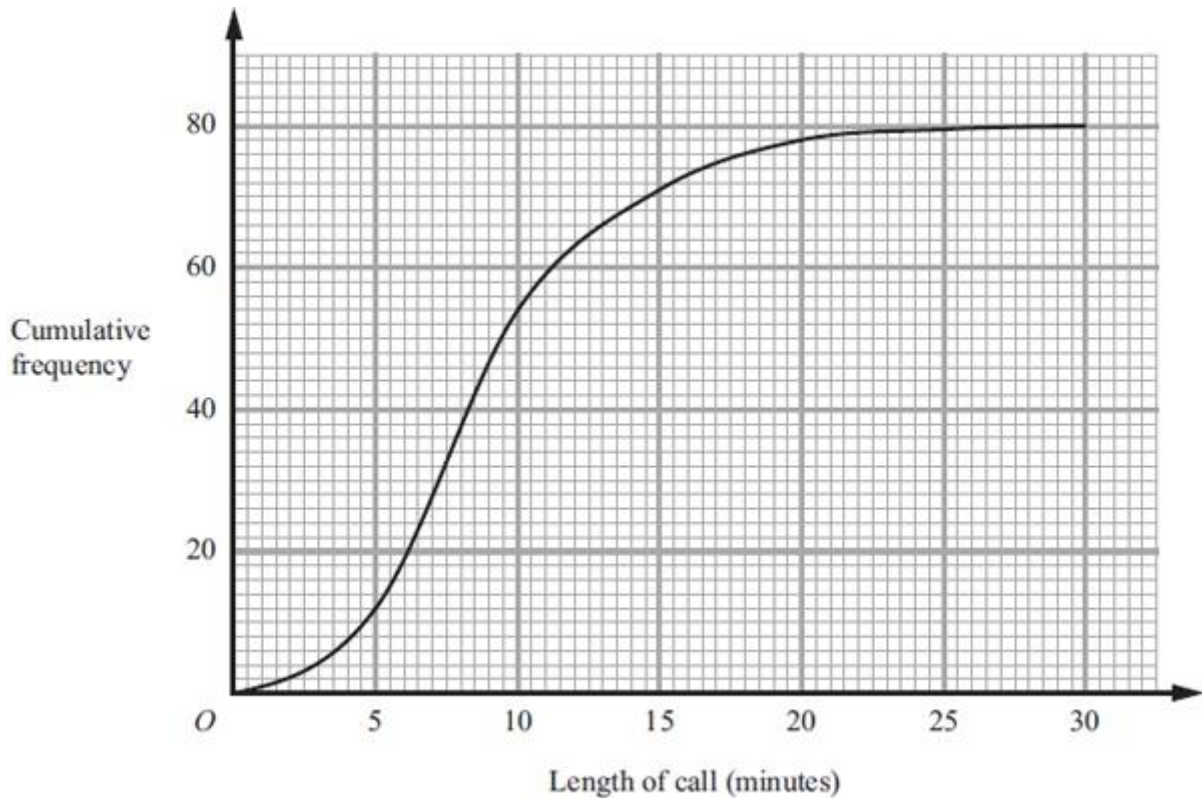   Show your working clearly.

....

(3)

(b) Write down 3 **different** factors of 224 with a sum between 99 and 110

....

(2)

(Total for question = 5 marks)

Q3.

The cumulative frequency graph gives information about the lengths, in minutes, of 80 telephone calls.

(a) Find an estimate for the number of calls which were longer than 15 minutes.

....

(2)

(b) Find an estimate for the interquartile range of the lengths of the 80 calls.

.... minutes

(2)

(Total for question = 4 marks)

Q4.

Zara must take 5 tests.
Each test is out of 100
After 4 tests, her mean score is 64%.

What score must Zara get in her 5th test to increase her mean score in all 5 tests to 70%?

....

(Total for Question = 3 marks)

Q5.
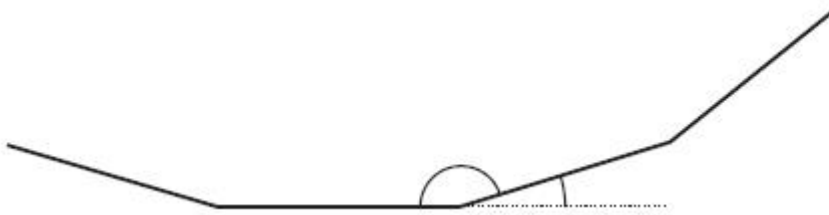
The diagram shows an incomplete regular polygon.

Diagram **NOT** accurately drawn

The size of each interior angle is 140 degrees greater than the size of each exterior angle.

Work out the number of sides the regular polygon has.

....

(Total for question = 3 marks)

Q6.

(a) Write 0.004 in standard form.

....

(1)

(b) Work out $\dfrac{2 \times 10^4 + 3 \times 10^5}{6.4 \times 10^{-2}}$

....

(2)

(Total for question = 3 marks)

Q7.

Simplify fully $\dfrac{(9x^4y^2)^{\frac{1}{2}}}{3x^2y^{-4}}$

....

(2)

(Total for question = 2 marks)

Q8.

In a fridge there are only

    3 bottles of water
    5 bottles of orange juice
    2 bottles of cola

Mary takes at random a bottle from the fridge and then Naveed takes at random a bottle from the fridge.

Work out the probability that Mary and Naveed both take a bottle of the same type of drink.

....

(3)

(Total for question = 3 marks)

Q9.

Show that $\dfrac{4 + \sqrt{8}}{\sqrt{2} - 1}$ can be written in the form a + b√2, where *a* and *b* are integers.

Show each stage of your working clearly and give the value of *a* and the value of *b*.

(Total for question = 3 marks)

Q10.

Here are the equations of five straight lines:

Line A   y = 2x – 3   Line B   2y = x – 6

Line C   2y = -3x – 2   Line D   2y = 4x – 1

Line E   3y = 2x – 2

(a) Two of these lines are parallel.

Write down the letters of these two parallel lines.   ………….. and …………..

(1)

(b) Two of these lines are perpendicular.

Write down the letters of these two perpendicular lines.   ………….. and …………..

(1)

(b) Two of these lines have the same y intercept.

Write down the letters of these lines.   ………….. and …………..

(1)
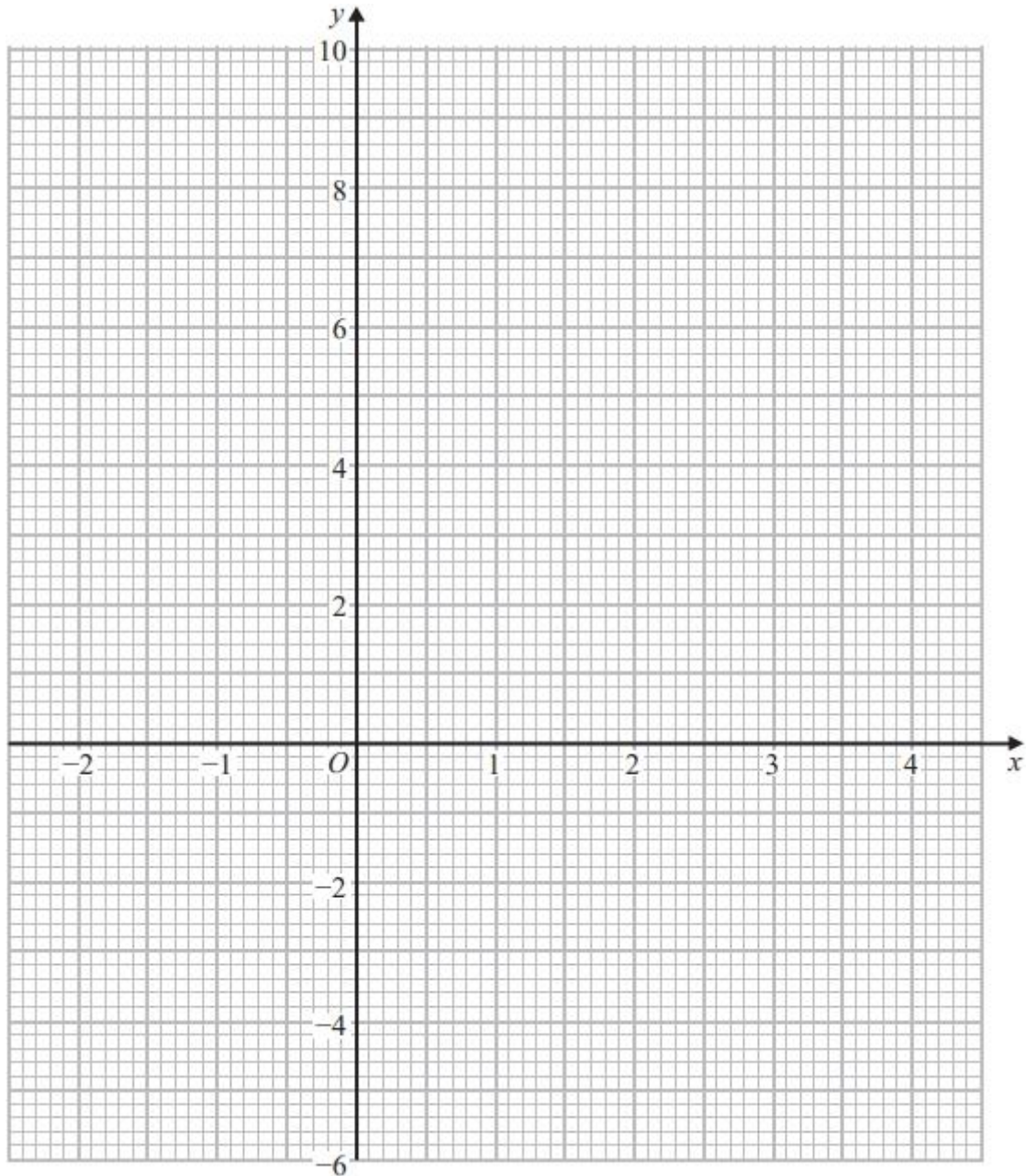
(Total for Question = 3 marks)

Q11.

(a) Complete the table of values for $y = x^2 - 3x - 1$

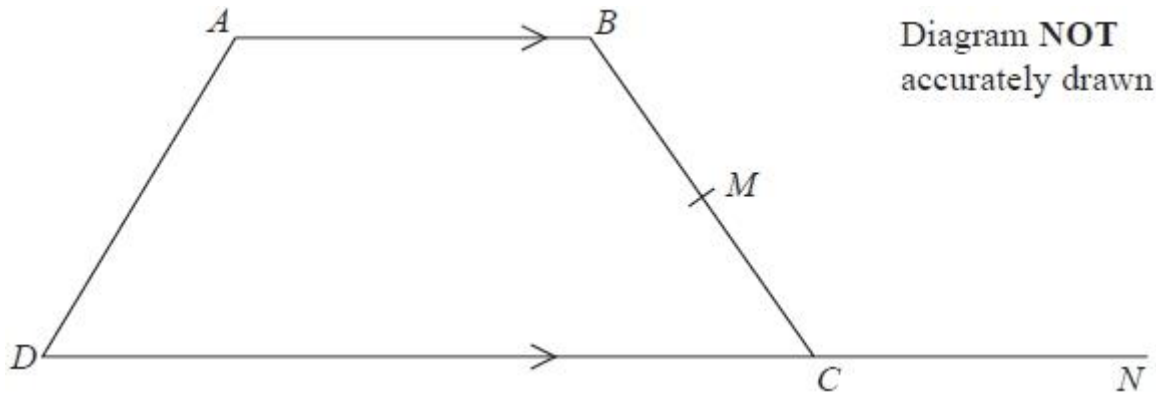| x	-2	-1	0	1	2	3	4
y			-1		-3		3

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x - 1$ for all values of x from -2 to 4

(2)

(Total for question = 4 marks)

Q12.

Diagram **NOT** accurately drawn

AB is parallel to DC
DC = 2AB
M is the midpoint of BC

$\overrightarrow{AD}$ = 2**b**

$\overrightarrow{AB}$ = 4**a**

(a) Find $\overrightarrow{BM}$ in terms of **a** and **b**.

Give your answer in its simplest form.

....

(2)

N is the point such that DCN is a straight line and DC : CN = 2 : 1
(b) Show that AMN is a straight line.

(2)

(Total for question = 4 marks)

Q13.

Use algebra to show that the recurring decimal $0.3\dot{8} = \dfrac{7}{18}$

(Total for Question = 2 marks)

Q14.

(a) Solve the inequalities $-4 < 3x + 5 \leq 11$

....

(2)

(b) Write down the integer values of x which satisfy $-4 < 3x + 5 \leq 11$

....

(2)

(Total for question = 4 marks)

Q15.

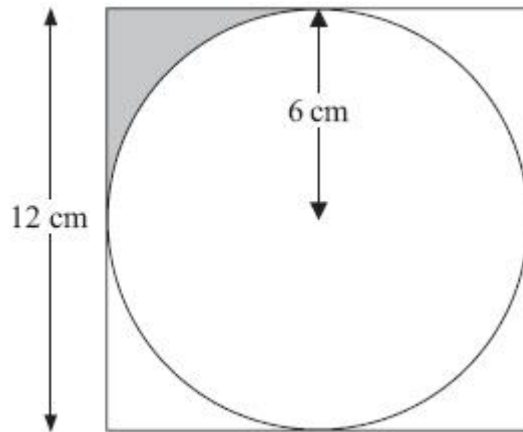The diagram shows a circle drawn inside a square.

Diagram **NOT** accurately drawn

6 cm

12 cm

The circle has a radius of 6 cm.
The square has a side of length 12 cm.
Work out the shaded area.
 Give your answer in terms of π.

....cm²

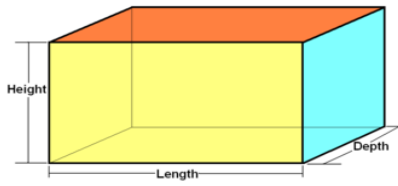**(Total for Question = 3 marks)**

Q16.

Diagram NOT accurately drawn.

A cuboid has length 6cm, depth 4cm and height 3cm.

(a) Find the surface area of the cuboid.

………………………… cm²

(2)

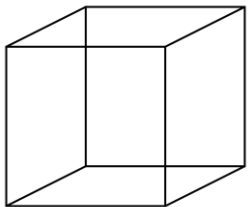A cube has twice the surface area of the cuboid in part (a)

Diagram NOT accurately drawn.
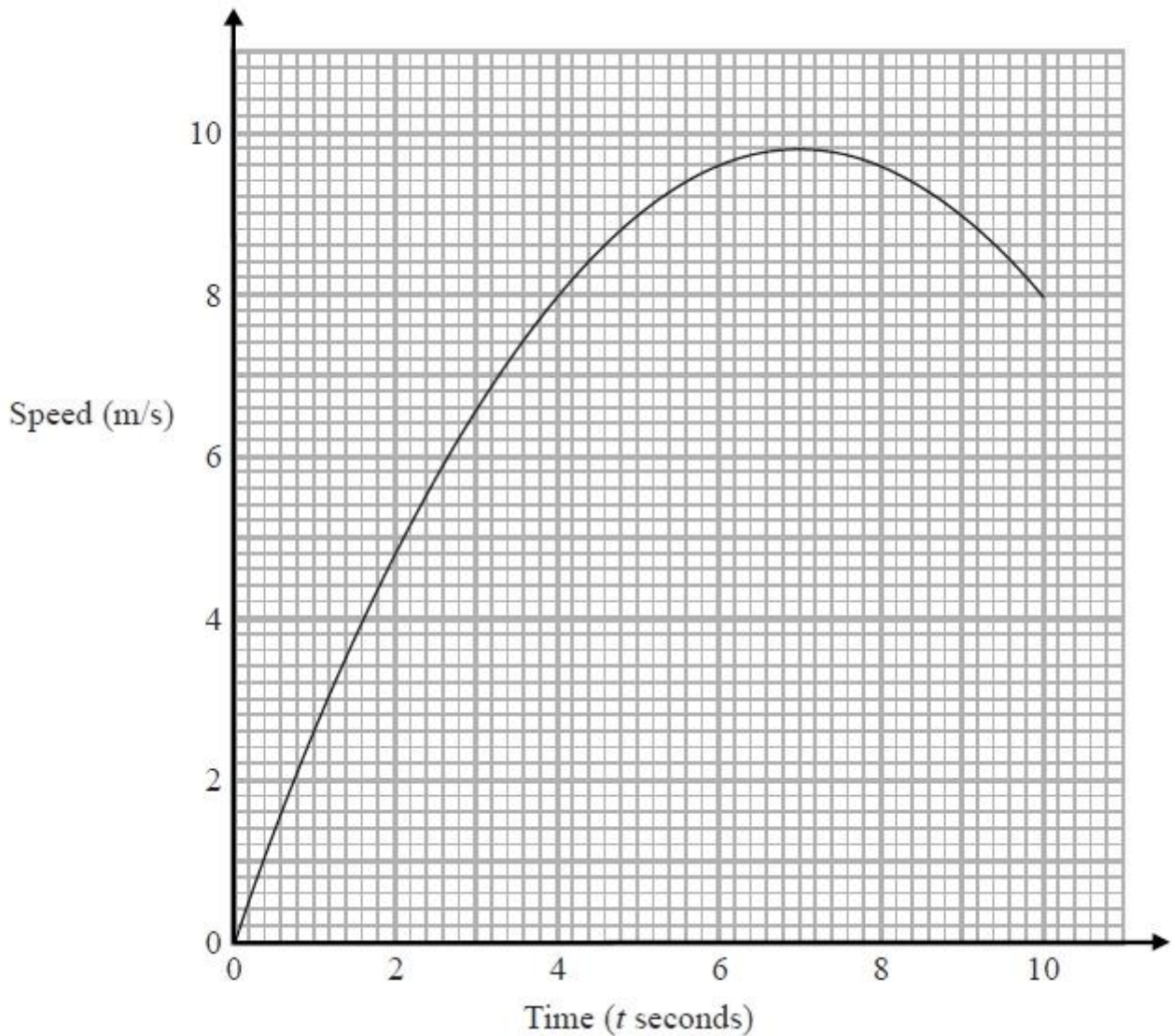
(b) Find the length of an edge.

………………………….. cm

(2)

(Total for question = 4 marks)

Q17. Karol runs in a race.

The graph shows her speed, in metres per second, t seconds after the start of the race.

(a) Calculate an estimate for the gradient of the graph when $t = 4$
     You must show how you get your answer.

....

(3)

(b) Describe fully what your answer to part (a) represents.

....

....

(2)

(Total for question = 5 marks)

Q18.

Metal A has a density of 5 g/cm^3 and metal B has a density of 3g/cm^3.

1200g of metal A and 600g of metal B are melted and mixed and then recast into a block.

    (a) What is the volume of the block?

…………………………… cm^3

(2)

    (b) What is the density of the block to the nearest integer?

…………………………. g/cm^3

(2)

(Total for Question = 4 marks)

Q19.

(x + 5) cm

Diagram **NOT**
accurately drawn

x cm
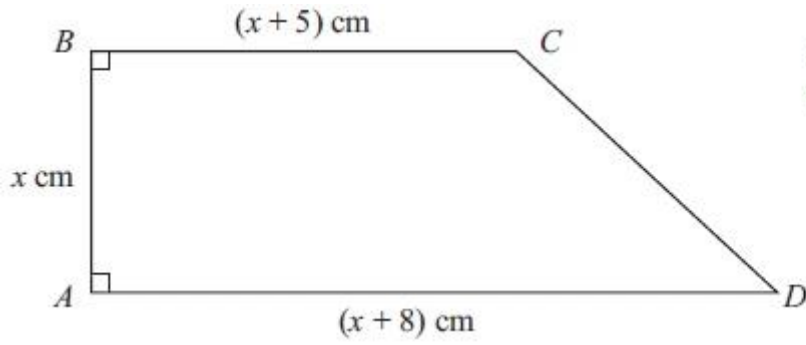
(x + 8) cm

The diagram shows a trapezium *ABCD* with *AD* parallel to *BC*.
AB = *x* cm, *BC* = (*x* + 5) cm and *AD* = (*x* + 8) cm.
The area of the trapezium is 42 cm².

(a) Show that $2x^2 + 13x - 84 = 0$

(2)

(b) Calculate the perimeter of the trapezium.

.... cm

(4)

(Total for question = 6 marks)

Q20.

The angles in a triangle are in the ratio 1 : 2 : 3

(a) Show that the triangle is a right-angled triangle.

(2)

(b) Write down the value of sin 30º

……………………………..

(1)

(c) The hypotenuse of the triangle is 15 cm long.
Calculate the length of the shortest side in the triangle.

………………………….. cm

(2)

(Total for Question = 5 marks)

Q21.

Simplify fully $\dfrac{4x^2 - 25}{6x^2 + 13x - 5}$

....

(Total for question = 3 marks)

Q22.

A circle with a centre 0, has an equation $x^2 + y^2 = 25$

The coordinate A (4,3) is on the circumference of the circle.

Find the equation of the tangent at point A.

…………………………………………...

(Total for question = 4 marks)

TOTAL FOR PAPER IS 80 MARKS