



Name: Video Solutions:



MATHS FOR GRANTED EASTER GCSE MOCK EXAMINATIONS 2023

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. Buses to Acton leave a bus station every 24 minutes.

Buses to Barton leave the same bus station every 20 minutes.

A bus to Acton and a bus to Barton both leave the bus station at 900am.

When will a bus to Acton and a bus to Barton next leave the bus station at the same time?

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

Q2. Work out the value of the following.
Give your answers in standard form.

(a) $(2.8 \times 10^9) \div (4 \times 10^5)$

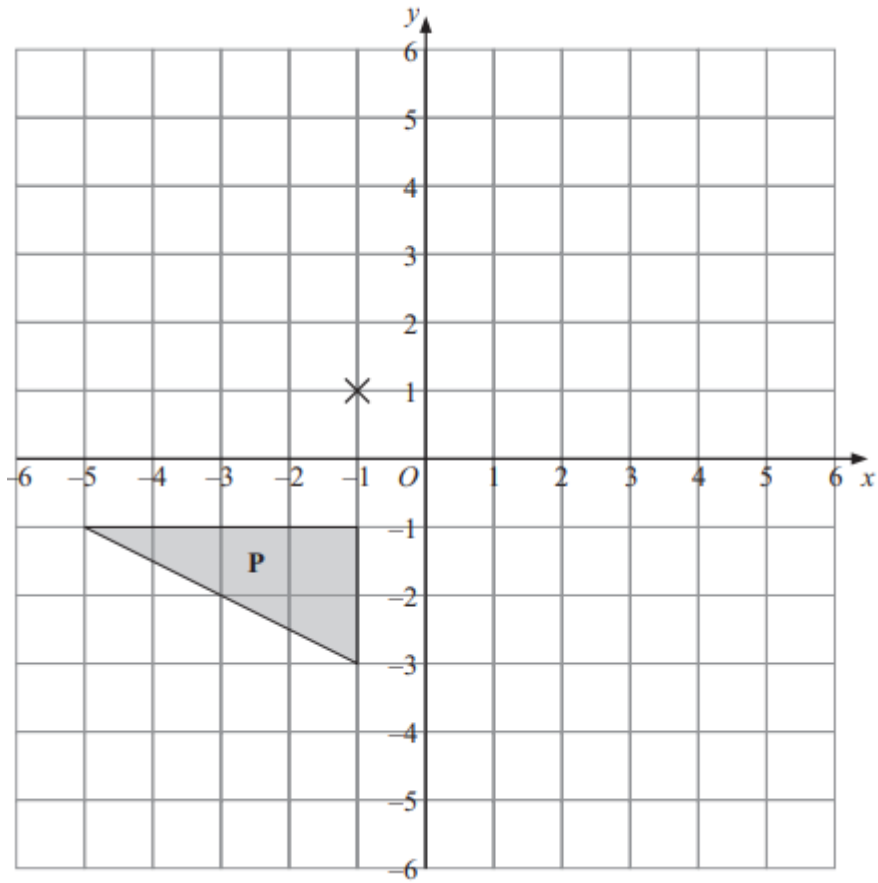
.....
(2)

(b) $(5 \times 10^{-3})^2$

.....
(2)

(Total for question = 4 marks)

Q3.



(a) Rotate triangle **P** 180° around the point $(-1, 1)$.

Label the new triangle **A**.

(2)

(b) Translate triangle **P** by the vector $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$.

Label the new triangle **B**.

(1)

(Total for question = 3 marks)

Q4.

(a) Work out $\frac{2}{7} + \frac{1}{5}$

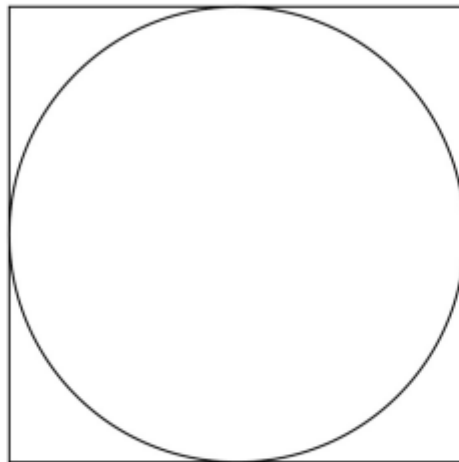
.....
(2)

(b) Work out $1\frac{2}{3} \div \frac{3}{4}$

.....
(2)
(Total for question = 4 marks)

Q5.

Here is a circle touching a square.



Not drawn
accurately

The area of the square is 64 cm^2

Work out the area of the circle.

Give your answer in terms of π .

..... cm^2
(Total for question = 3 marks)

Q6.

a) Work out 7^{-2}

.....
(1)

b)

Use numbers from this box to complete the statements.

0	1	$\sqrt{2}$	$\sqrt{3}$
$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{3}}$	$\frac{\sqrt{3}}{2}$

(i) $\tan 45^\circ = \dots\dots\dots$

(1)

(ii) $\cos 30^\circ = \dots\dots\dots$

(1)

(Total for question = 3 marks)

Q7. Solve the simultaneous equations:

$$\begin{aligned} 4x + y &= 25 \\ x - 3y &= 16 \end{aligned}$$

$x = \dots\dots\dots$, $y = \dots\dots\dots$
(Total for question = 3 marks)

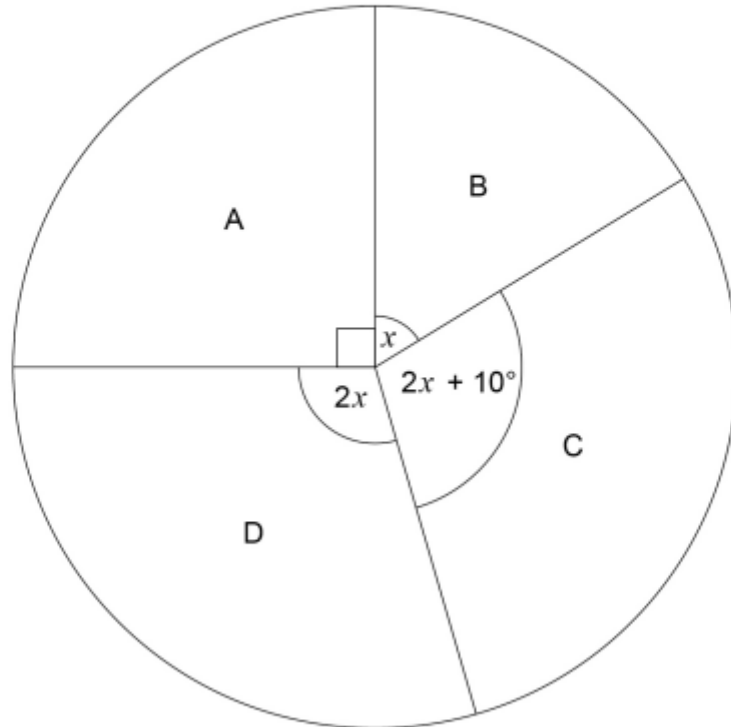
Q8.

The four candidates in an election were A, B, C and D.

The pie chart shows the proportion of votes for each candidate.

Proportion of votes

Not drawn accurately



Work out the probability that a person who voted, chosen at random, voted for C.

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

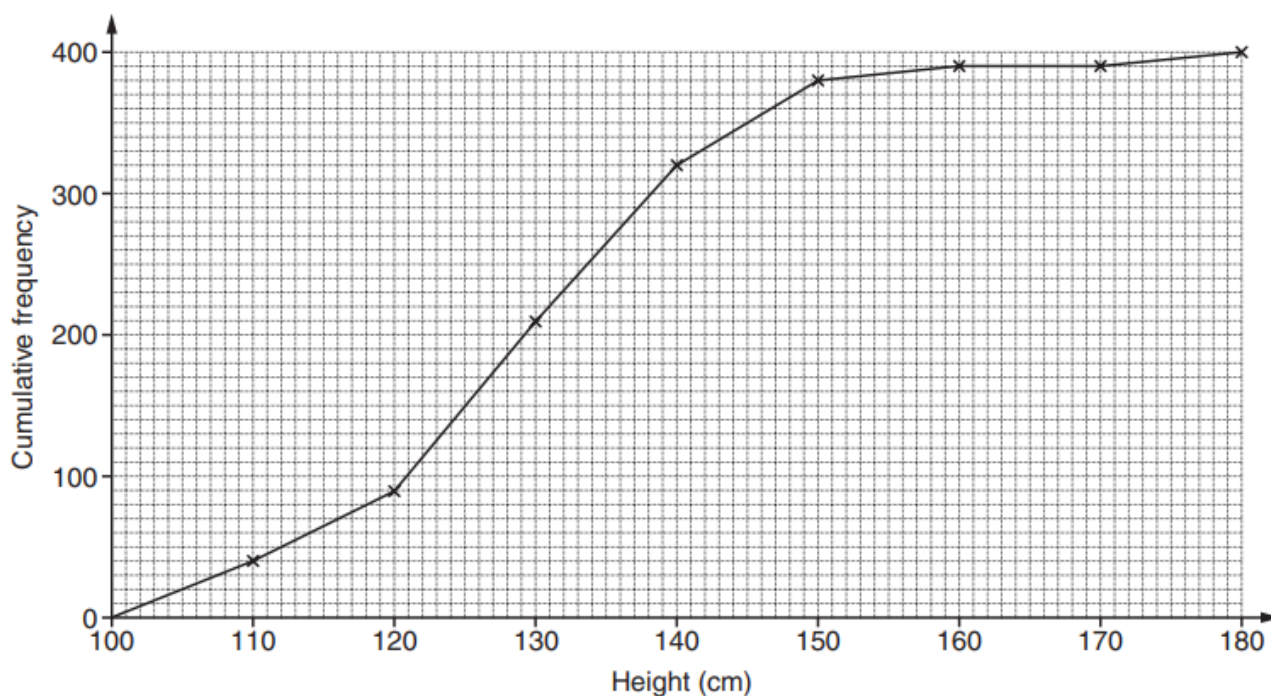
Q9. Work out an estimate for

$$\frac{302 \times 9.96}{0.51}$$

.....

(Total for question = 3 marks)

Q10. The cumulative frequency diagram shows the distribution of heights, in cm, of 400 students in a school.



Use the diagram to find an estimate of:

(a) the median height,

.....cm
(1)

(b) the number of students with height less than 124cm,

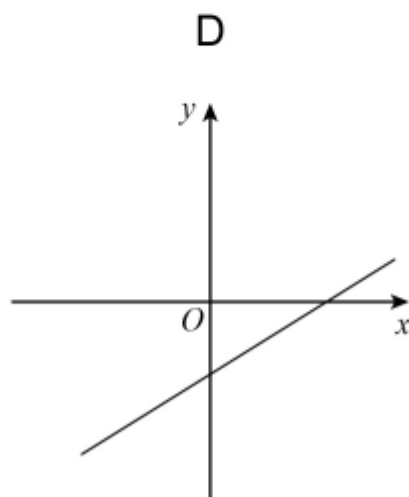
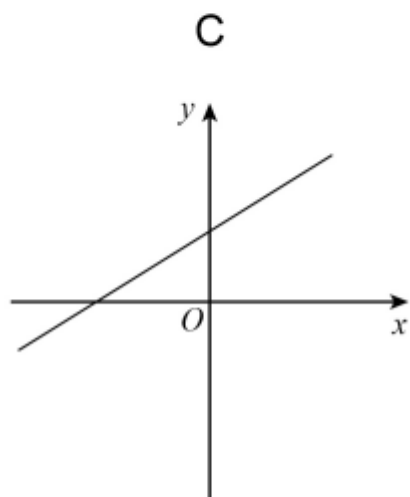
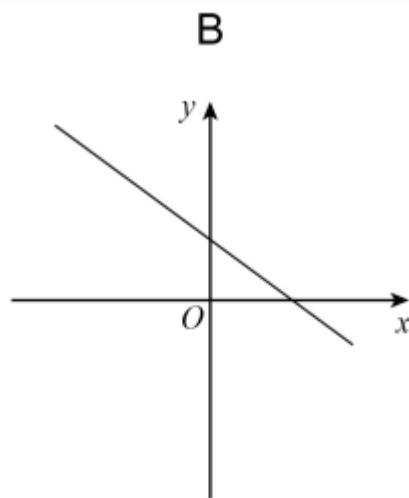
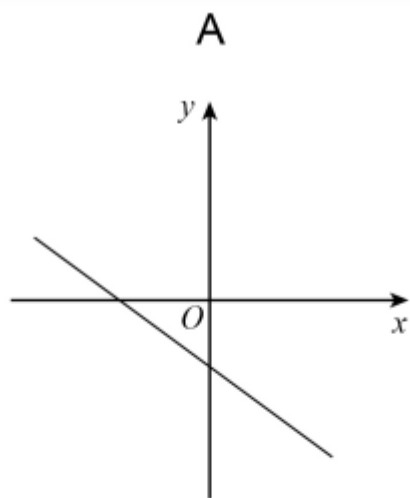
.....
(1)

(c) the number of students with height more than 147cm.

.....
(2)

(Total for question = 4 marks)

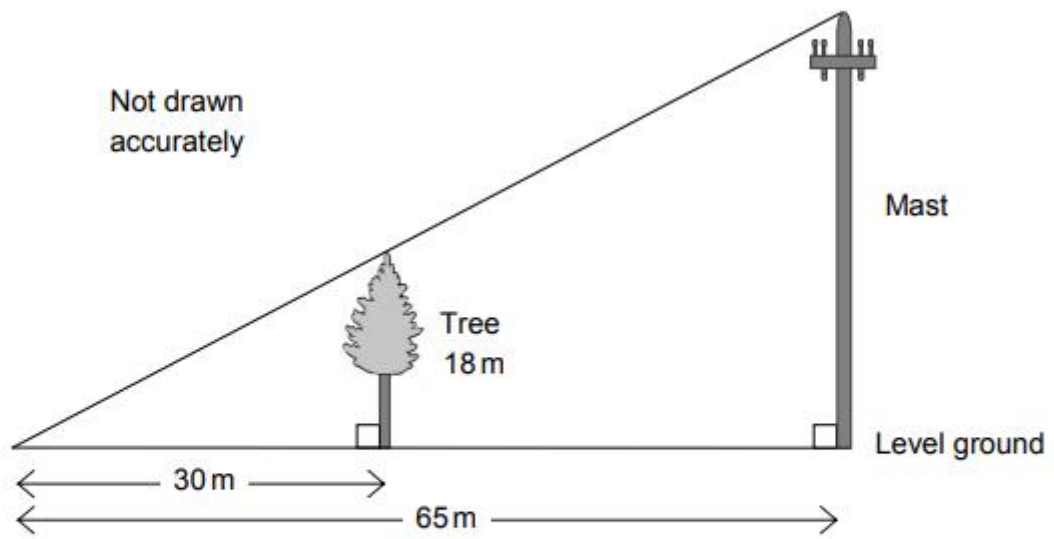
- Q11.** Here are four sketch graphs.
Circle the letter of the sketch graph that represents $3x + 2y = 5$



(Total for question = 1 mark)

Q12.

The diagram shows a tree of height 18 metres and a mast on level ground.



The mast is about to fall over, pivoting about its base.

Could it hit the tree?

Show clearly how you decide.

.....

(Total for question = 4 marks)

Q13. For a cone of fixed volume, the height, h , is inversely proportional to the square of the radius, r .

When the height is 4.5 cm, the radius is 4cm.

(a) Express h in terms of r .

$$h = \dots\dots\dots$$

(3)

(b) Find the radius when the height is 8 cm.

$$r = \dots\dots\dots\text{cm}$$

(2)

(Total for question = 5 marks)

Q14.

Express the recurring decimal $0.2\dot{8}\dot{1}$ as a fraction in its simplest form.

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

Q15. Expand and simplify fully $(2x - 5)(3x - 4)(x + 2)$

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

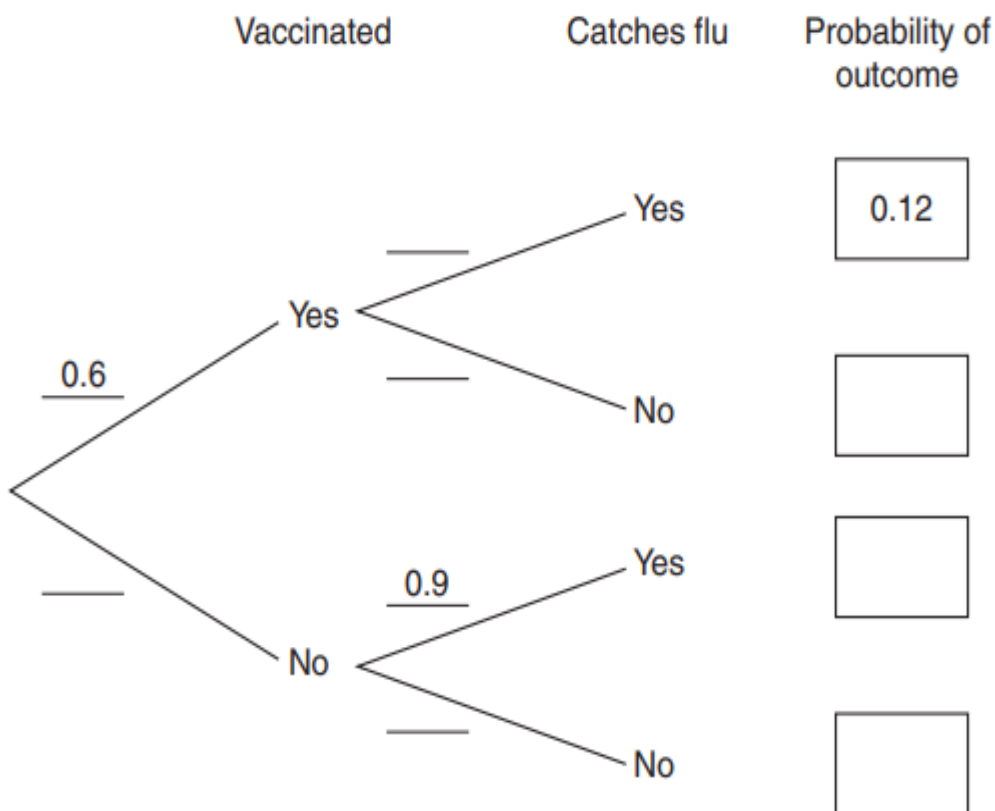
Q16.

60% of people in a village are vaccinated against flu.

The probability that a person in the village is vaccinated **and** catches flu is 0.12.

The probability that a person in the village who is not vaccinated catches flu is 0.9.

- (a) Complete the tree diagram and fill in the boxes showing the probability of each possible outcome.



(3)

- (b) Work out the probability that a person in the village, chosen at random, does not catch flu.

.....
(2)
(Total for question = 5 marks)

Q17.

Miriam's date of birth is 14/09/2006

She makes a 4-digit number code using digits from her date of birth.

The 4-digit number she makes must

not start with 0

have all different digits.

How many codes can she make?

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

Q18.

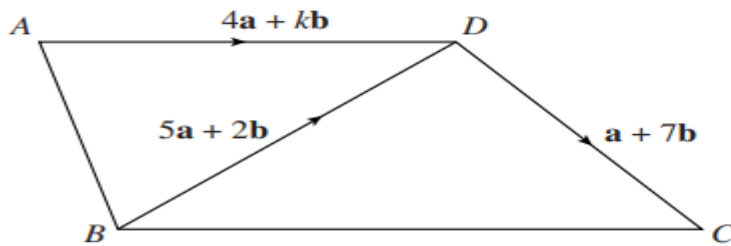
Make b the subject of the formula $a = \frac{2-7b}{b-5}$

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

Q19.

$ABCD$ is a trapezium.
 BC is parallel to AD .

$\vec{BD} = 5\mathbf{a} + 2\mathbf{b}$, $\vec{DC} = \mathbf{a} + 7\mathbf{b}$ and $\vec{AD} = 4\mathbf{a} + k\mathbf{b}$, where k is a number to be determined.



Not drawn accurately

Find the value of k .
You **must** show your working.

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

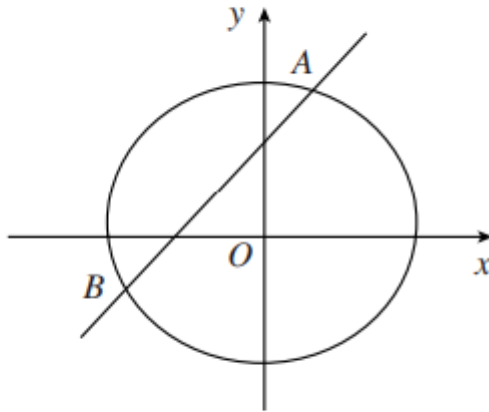
Q20.

Simplify fully $\frac{3x^2 - x - 14}{9x^2 - 4} \div \frac{x + 2}{3x^2 + 2x}$

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

Q21.

The diagram shows the circle $x^2 + y^2 = 26$ and the line $y = x + 4$
The line and the circle intersect at the points A and B .



Not drawn accurately

(a) Show that the x coordinates of A and B satisfy the equation $x^2 + 4x - 5 = 0$

(b) Hence find the coordinates of A and B .

(3)

$A = (\dots, \dots)$ $B = (\dots, \dots)$
(2)

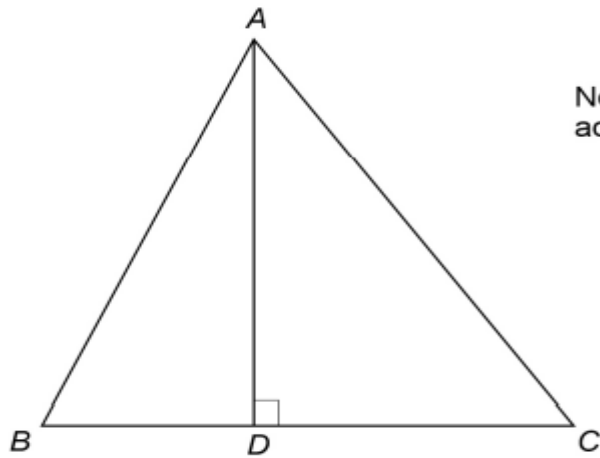
(Total for question = 5 marks)

Q22.

ABC is a triangle.

The perpendicular from A meets BC at D .

$$BC = (6 + 2\sqrt{7}) \text{ cm}$$



Not drawn
accurately

$$\text{Area of triangle } ABC = (13 + 3\sqrt{7}) \text{ cm}^2$$

Work out the length, in cm, of AD .

Give your answer in the form $a + b\sqrt{c}$ where a , b and c are integers.

.....cm

(Total for question = 4 marks)

TOTAL FOR PAPER IS 80 MARKS