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SCAN ME

# PRACTICE PAPER FOR

# Edexcel Paper 1H (June 2023)

## ---------- Disclaimer ----------

In 2022 I wrote a series of predicted papers that in many cases reflected the real exam paper very well. This was due to the exam boards providing advance information on the topics that were going to be in each paper. This information is no longer provided so “predicting” a paper is not possible. Nobody can know what topics and types of questions will come up in each paper, apart from the few examiners that write them.

This paper has been created based on the **most common** paper 1 topics from previous years. Due to the nature of some topics they are better suited to paper 1 as if you had a calculator they would no longer be difficult to do. The paper should be excellent at helping students revise for exams, however should not be relied upon as the basis for revision. The topics from this paper may well appear in the real exams, however there is absolutely no guarantee of this for the reasons previously mentioned. Some topics may appear, some may not.

Ultimately the best way to prepare for the exams is to **revise all topics**.

## ---------- INFORMATION FOR TEACHERS ----------

**You will want to remove this page before printing to ensure that questions across a double page print in the correct places.**

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This paper been produced with careful analysis from previous papers.

The **Series** percentage below shows the percentage of times that this topic came up across a whole set of 3 papers. Some topics tend to appear almost every year in at least one paper.

The **Paper 1** percentage below shows the percentage of times that this topic came up specifically in the non calculator paper. As expected certain topics favour paper 1 over paper 2/3

I hope you find this data interesting/useful!

| Topic | Series | Paper 1 | Question(s) |
|---|---|---|---|
| Prime Factorisation | 50% | 40% | 1 |
| HCF/LCM | 60% | 30% | 1 |
| Index Laws | 100% | 100% | 2, 11 |
| Application of Ratio | 90% | 40% | 3 |
| Averages and the Range | 80% | 50% | 3 |
| Quadratic Graphs | 90% | 40% | 4 |
| Standard Form | 100% | 30% | 5 |
| Estimation | 60% | 50% | 6 |
| Speed, Distance, Time | 90% | 40% | 7 |
| Multiple Ratio Problem | 100% | 50% | 8 |
| Algebraic Fractions | 90% | 70% | 9, 18 |
| Special Types of Graphs | 70% | 40% | 10 |
| Probability of Successive Events | 100% | 70% | 12 |
| Recurring Decimals to Fractions | 80% | 50% | 13 |
| Parallel and Perpendicular Lines | 70% | 40% | 14 |
| Transformations | 90% | 50% | 15 |
| % of an amount OR %increase/decrease | 80% | 40% | 16 |
| Cumulative Frequency | 80% | 40% | 16 |
| Functions | 90% | 50% | 17 |
| Surds | 80% | 80% | 17, 18 |
| Fraction Operations | 60% | 60% | 18 |
| Complete the Square | 70% | 40% | 19 |
| Form Equation/Formula from Context | 80% | 60% | 20 |
| Solve Quadratic Equation | 70% | 50% | 20 |

**Answer ALL questions**

**Write your answers in the spaces provided**

**You must write down all the stages in your working.**

**1** $A = 2^3 \times 5 \times 31$

(a) Write 6A as a product of its prime factors.

.....

**(2)**

$B = 2^2 \times 5 \times 7 \times 31$

(b) Find the highest common factor (HCF) of A and B.

.....

**(2)**

**(Total for Question 1 is 4 marks)**

**2** (a) Find the value of $32^0$

.....

**(1)**

(b) Simplify $(3xy^3)^3$

.....

**(2)**

**(Total for Question 2 is 3 marks)**

**3** 20 students were asked how many siblings they had. The table shows some of the information.

| Siblings | Number of Students |
|---|---|
| 0 | 1 |
| 1 | |
| 2 | 7 |
| 3 | |

None of the students had more than 3 siblings.

Number of students with 1 sibling : Number of students with 3 siblings = 1 : 2

Work out the mean number of siblings for the 20 students asked.

..... siblings

**(Total for Question 3 is 4 marks)**



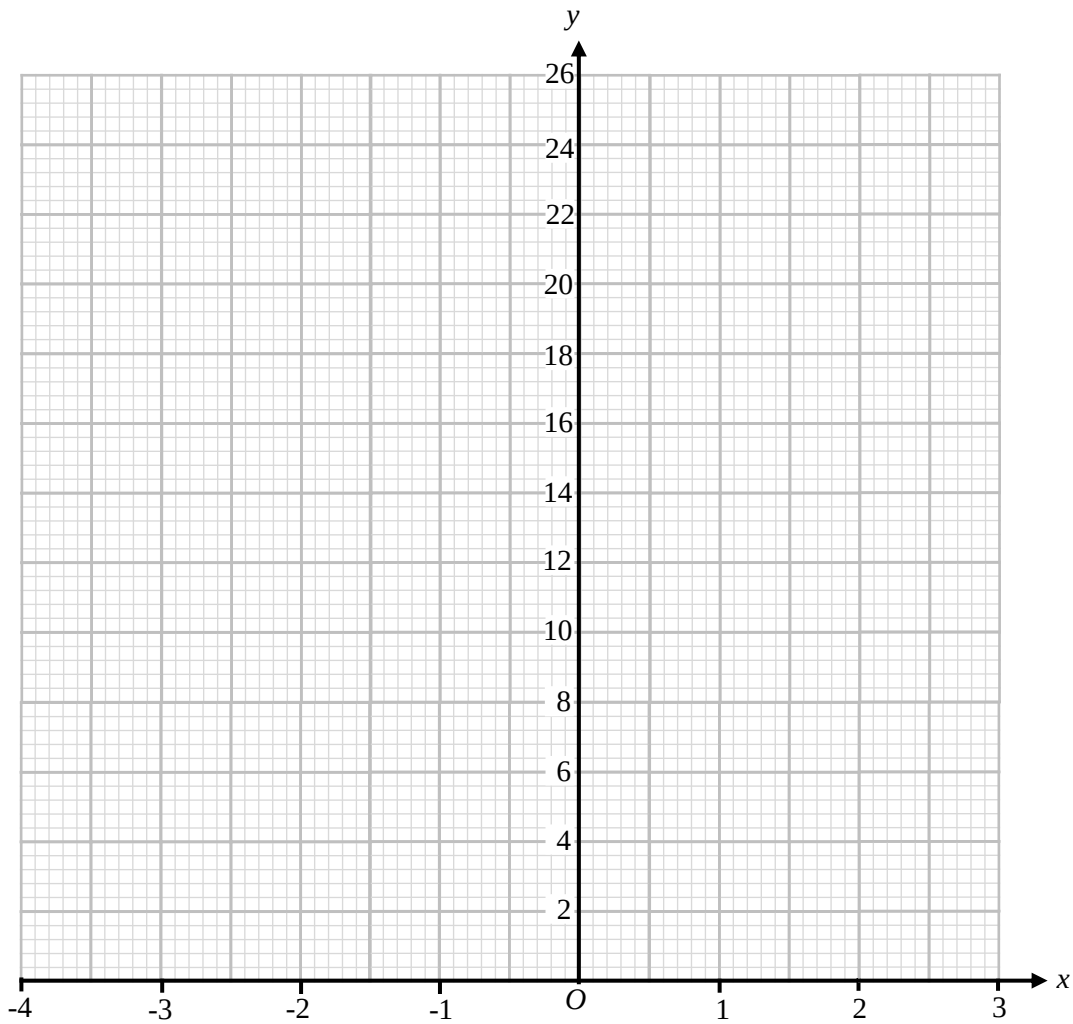
*Turn over* ▶

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

| $x$ | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|---|
| $y$ | | | 9 | 4 | | | 1 | 4 |

**(2)**

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




**(2)**

(c) Write down the coordinates of the turning point of the graph

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

**(1)**

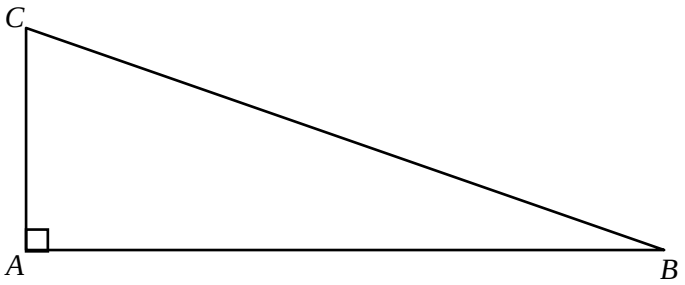
(d) Write down the equation of the line of symmetry of the graph of $y = x^2 - 2x + 1$

.....

**(1)**

**(Total for Question 4 is 6 marks)**

**5** Here is a right-angled triangle.




$AB = 3 \times 10^4$ cm
$AC = 8 \times 10^3$ cm

(a) Write down the ratio $AB : AC$
Give your answer in its simplest form.

.....

**(2)**

(b) Calculate the area of triangle $ABC$.
Give your answer in standard form.

.....

**(3)**

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

**6** A machine can produce a new paperclip every 0.53 seconds.

(a) Find an estimate for the number of paper clips that 18 of these machines could produce in 1 minute.

.....

**(3)**

(b) Is your answer to part (a) an underestimate or an overestimate?
You must give a reason for your answer.

.....

.....

.....

**(1)**

**(Total for Question 6 is 4 marks)**

**7** An athlete is going to run 2 laps of a 400 m athletics track.

The first lap is a warmup up and they run at an average speed of $x$ m/s
The second lap they run at an average speed that is 5 times as fast as for their first lap.

The total time taken to complete both laps is 320 seconds.

Find the value of $x$, the average speed of the athlete during the first lap.

..... m/s

**(Total for Question 7 is 4 marks)**

**8** A bag contains only red, green and blue counters.

red counters : green counters : blue counters = 3 : 4 : 5

15 red counters and some blue counters are added to the bag. The ratio after this is shown below.

red counters : green counters : blue counters = 7 : 6 : 8

Work out the **total** number of counters in the bag after the red and blue counters were added.

.....

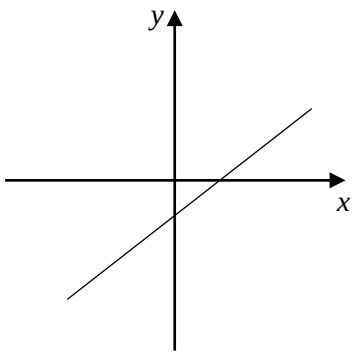
**(Total for Question 8 is 4 marks)**

**9** Write $\frac{5}{2xy^2} - \frac{1}{x^2}$ as a single fraction in its simplest form

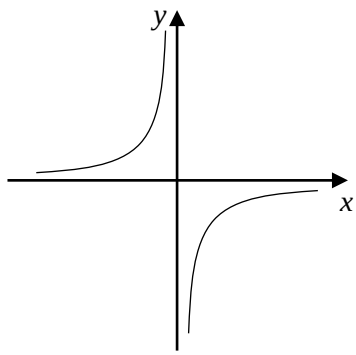
.....

**(Total for Question 9 is 2 marks)**

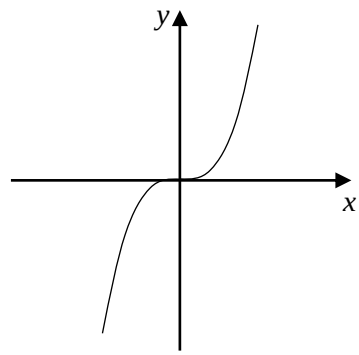
**10** Here are some graphs




Graph A




Graph B




Graph C

Here is a table showing some equations.

| | | |
|---|---|---|
| $y = x + 4$ | $y = \frac{1}{x}$ | $y = x^3$ |
| $y = x - 4$ | $y = -\frac{1}{x}$ | $y = -x^3$ |
| $y = 4 - x$ | $y = \frac{1}{4x}$ | $y = x^3 + 4$ |

(a) Write down an equation from the table above that could be the equation of graph A.

.....

**(1)**

(b) Write down an equation from the table above that could be the equation of graph B.

.....

**(1)**

(c) Write down an equation from the table above that could be the equation of graph C.

.....

**(1)**

**(Total for Question 10 is 3 marks)**

**11** (a) Write $(27)^3 \times \sqrt{3}$ as a power of 3

.....

**(2)**

(b) Find the value of $\left(\frac{1}{27}\right)^{-\frac{2}{3}}$

.....

**(2)**

**(Total for Question 11 is 4 marks)**

**12** A bag contains blue, red and green counters.

$\frac{1}{4}$ of the counters are red.

A counter is randomly drawn from the bag. Its colour is noted and then it is replaced back into the bag.

A second counter is then randomly drawn from the bag.

The probability that the first counter is red and the second counter is green = $\frac{1}{6}$

Calculate the probability that both counters drawn are blue.

.....

**(Total for Question 12 is 4 marks)**

**13** $x = 0.\dot{3}\dot{1}\dot{8}$

Prove algebraically that $x$ can be written as $\frac{7}{22}$

.....

**(Total for Question 13 is 3 marks)**

**14** The straight line $\mathbf{L_1}$ has the equation $2y = 8 - 5x$

The straight line $\mathbf{L_2}$ has the equation $10y - 4x - 15 = 0$

Hannah says:

"$\mathbf{L_1}$ and $\mathbf{L_2}$ are perpendicular lines"

Is Hannah correct?

Give reasons for your answer.

.....

.....

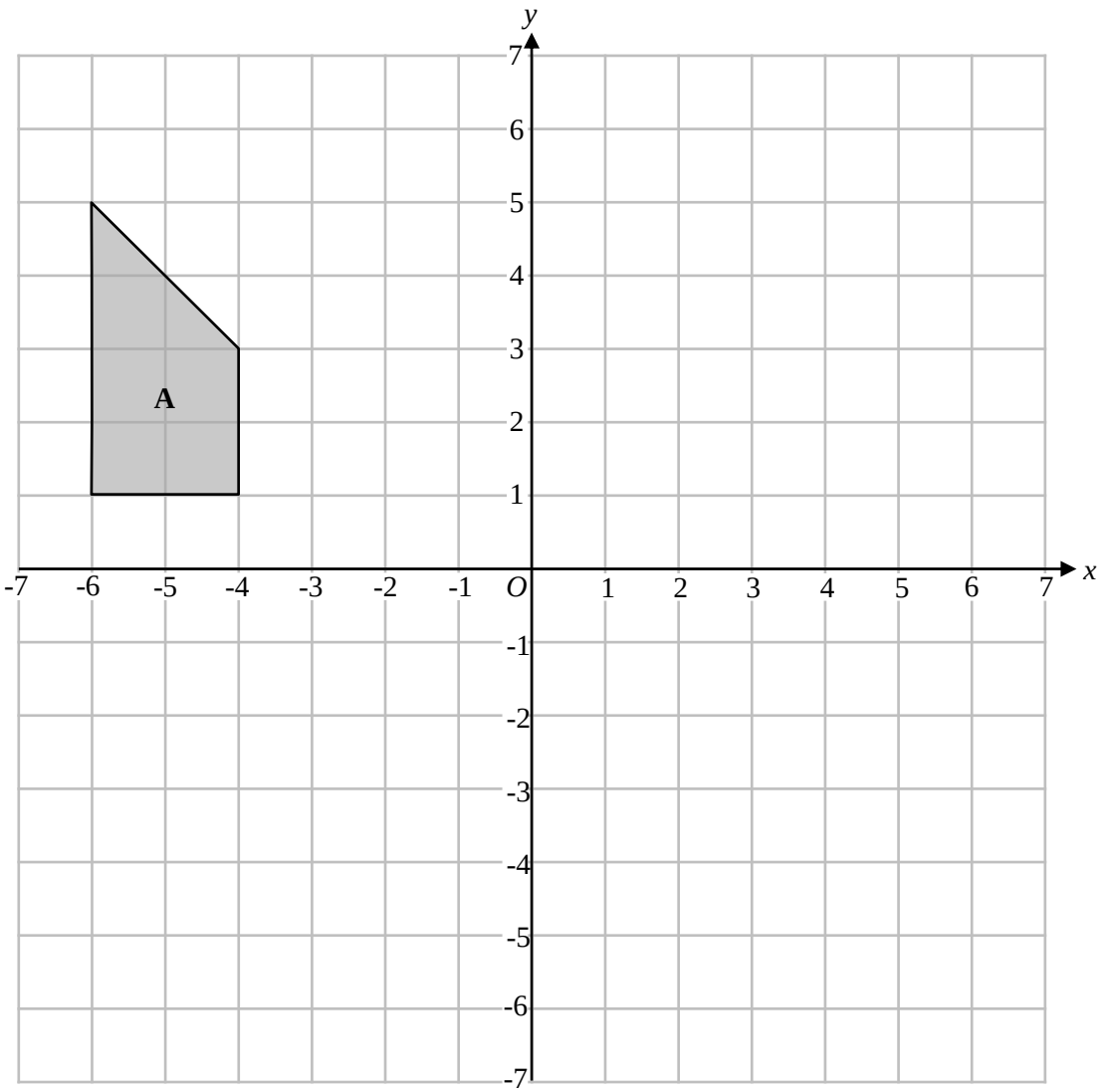
.....

.....

.....

**(Total for Question 14 is 3 marks)**

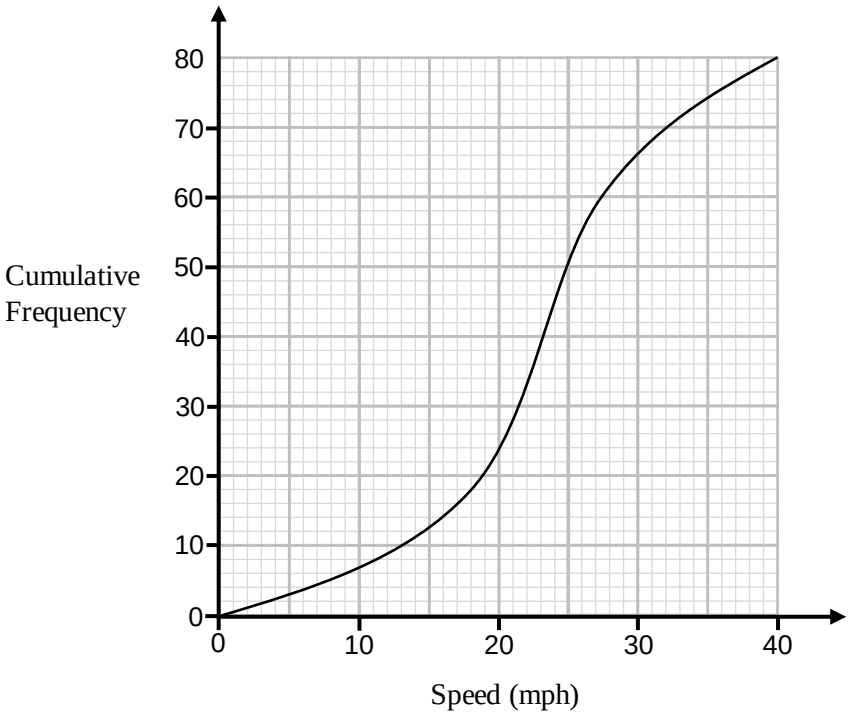
**15**




Enlarge shape A by scale factor $-1\frac{1}{2}$ with centre of enlargement (-2, 3).
Label your image B.

**(Total for Question 15 is 2 marks)**

**16** The cumulative frequency graph shows information about the speed of 80 vehicles on a road.




(a) Use the graph to find an estimate of the interquartile range of the speeds of the vehicles.

..... mph

**(2)**

The speed limit on the road is 30 mph.

Colin says:

"More than 20% of the cars on the road were exceeding the speed limit".

(b) Show that Colin is incorrect.

**(2)**

**(Total for Question 16 is 4 marks)**

**17** The functions f and g are such that

$$f(x) = \frac{8}{3 + x} \quad \text{for } x > 0 \quad \text{and} \quad g(x) = \sqrt{2x + 1} \quad \text{for } x > 0$$

(a) Find $f^{-1}(x)$

$f^{-1}(x) =$ .....

**(2)**

(b) Find $fg(2)$ giving your answer in the form $a - b\sqrt{c}$, where $a$, $b$ and $c$ are all integers.

.....

**(4)**

**(Total for Question 17 is 6 marks)**



*Turn over* ▶

**18** Show that $1\frac{1}{3} \div \left[ \frac{2x-14}{4x^2-9} \times \frac{2x^2+17x+21}{x^2-49} \right]$ simplifies to $\frac{ax-b}{c}$ where $a$, $b$ and $c$ are integers.

.....

**(Total for Question 18 is 5 marks)**

**19** $2x^2 + 12x + 7 = a(x + b)^2 - c$

(a) Find the value of $a$, $b$ and $c$.

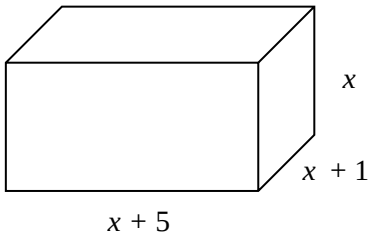
$a$ = .....

$b$ = .....

$c$ = .....

**(Total for Question 19 is 3 marks)**

**20** Here is a cuboid with surface area $S$.




(a) Show that $S = 6x^2 + 24x + 10$

**(3)**

(b) Given that $S = 58$ cm$^2$, find the length of the shortest side of the cuboid.

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

.....

**(4)**

**(Total for Question 20 is 7 marks)**

**TOTAL FOR PAPER IS 80 MARKS**