Pearson Edexcel
International GCSE

Total Marks

Mathematics A

PAPER 2H
Higher Tier
(Calculator)

Time: 2 hours plus your additional time allowance.

In the boxes below, write your name, centre number and candidate number.

Surname	
Other names	
Centre Number	
Candidate Number	

Q65918A

Pearson

YOU MUST HAVE

Ruler, protractor, compasses, writing and drawing equipment, calculator. Tracing paper may be used.

YOU WILL BE GIVEN

Diagram Book
Formulae Pages

INSTRUCTIONS

Answer ALL questions.

Without sufficient working, correct answers may be awarded no marks.

Answer the questions in the spaces provided in this Question Paper or on the separate diagrams – there may be more space than you need.

CALCULATORS MAY BE USED.

You must NOT write anything on the Formulae Pages. Anything you write on the Formulae Pages will gain NO credit.

INFORMATION

The total mark for this paper is **100**

The marks for EACH question are shown in brackets
− use this as a guide as to how much time to spend on
each question.

There may be spare copies of some diagrams.

You may be provided with a model for Question **10**
It is NOT accurate.

ADVICE

Read each question carefully before you start to
answer it.

Check your answers if you have time at the end.

Good luck with your examination.

Answer ALL TWENTY THREE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1.   Write **600** as a product of powers of its prime factors.

Show your working clearly.

(3 marks)

Answer space continues on the next page.

1. **continued.**

(Total for Question 1 is 3 marks)

1. **continued.**

2. **Show that**

$$2\frac{4}{7} \div 1\frac{1}{8} = 2\frac{2}{7}$$

(3 marks)

Answer space continues on the next page.

2. **continued.**

(Total for Question 2 is 3 marks)

3.   **The bearing of Paris from London is 149°**

Work out the bearing of London from Paris.

_____ **°**

(Total for Question 3 is 2 marks)

4. $\mathcal{E}$ = {letters of the alphabet}

B = {b, r, a, z, i, l}

I = {i, r, e, l, a, n, d}

(a) List the members of the set

(i) B $\cup$ I

_____

(ii) B $\cap$ I'

_____

(2 marks)

(continued on the next page)

4. continued.

Remember:

$\mathscr{E}$ = {letters of the alphabet}

B = {b, r, a, z, i, l}

I = {i, r, e, l, a, n, d}

K = {k, e, n, y, a}

Cody writes down the statement $B \cap K = \emptyset$

Cody's statement is wrong.

(b) Explain why.

   (1 mark)

_____

_____

_____

(Total for Question 4 is 3 marks)

5. Look at the diagram for Question 5 in the Diagram Book.

It is NOT accurately drawn.

ABCD and **FGHI** are parallel straight lines.
EBGJ and **ECH** are straight lines.

BE = CE

Angle **BEC = 44°**

Work out the size of angle **JGH**

Give a reason for each stage of your working.

(5 marks)

Answer space continues on the next page.

5.   **continued.**

_____ °

(Total for Question 5 is 5 marks)

Turn over

6. Mariana sells bags of bird food.

    The bags that Mariana sold last week each contained **12 kg** of seeds.

    The bags that she is going to sell next week will each contain a mixture of nuts and seeds where for each bag

    weight of nuts : weight of seeds **= 4 : 5**

    The total weight of the nuts and the seeds in each bag will be **19·35 kg**

    The weight of seeds in each bag that Mariana sells next week will be less than the weight of seeds in each bag that Mariana sold last week.

Turn over

6. **continued.**

Work out this decrease as a percentage of the weight of seeds in each bag that Mariana sold last week.

Give your answer correct to one decimal place.

(4 marks)

Answer space continues on the next page.

6. **continued.**

_____%

(Total for Question 6 is 4 marks)

7. **Look at the diagram for Question 7 in the**

   Diagram Book.

   It is NOT accurately drawn.

   It shows a right–angled triangle ABC

   AB = x cm

   AC = 6·5 cm

   Angle **ABC = 42°**

   Angle **ACB** is a right–angle.

   Work out the value of x

   Give your answer correct to one decimal place.

   (3 marks)

   Answer space continues on the next page.

7.   **continued.**

x = _____

(Total for Question 7 is 3 marks)

8. **Solve the simultaneous equations**

    $$5r + 2t = 10$$
    $$2r - 4t = 7$$

    Show clear algebraic working.

    (3 marks)

    Answer space continues on the next page.

8. **continued.**

r = _____

t = _____

(Total for Question 8 is 3 marks)

Turn over

9. (i) Factorise

$$y^2 + 2y - 24$$

(2 marks)

_____

(ii) Hence solve

$$y^2 + 2y - 24 = 0$$

(1 mark)

_____

(Total for Question 9 is 3 marks)

Turn over

10. Look at Diagram 1 and Diagram 2 for Question 10 in the Diagram Book.

    You may be provided with a model.

    They are NOT accurate.

    Diagram 1 and the model show a triangular prism, **ABCDEF**

    Diagram 2 shows the cross section of the prism, **AED**

    BC = AD = 11·2 cm

    DC = EF = AB = 15 cm

    ED = FC = 7·4 cm

    Angles **AED** and **BFC** are right angles.

    Work out the volume of the prism.

    Give your answer correct to **3** significant figures.

    (5 marks)

    Answer space continues on the next two pages.

Turn over

10. **continued.**

10. continued.

_____ **cm**^{3}

(Total for Question 10 is 5 marks)

11. Chengbo sold a house for **180 000** yuan.

The amount for which he sold the house is

24% more than the amount he paid for the house.

(a) Work out how much Chengbo paid for

the house.

Give your answer correct to **3** significant figures.

(3 marks)

_____ yuan

(continued on the next page)

11. continued.

Zhi bought a house on **1**st January **2017**

When she bought the house, its value was

120 000 yuan.

The value of the house increased by

1·8% per year.

(b) Work out the value of Zhi's house on

1st January **2020**

Give your answer correct to **3** significant figures.

(3 marks)

Answer space continues on the next page.

Turn over

11. (b) continued.

_____ **yuan**

(Total for Question 11 is 6 marks)

Turn over

12. Look at the diagram for Question 12(a) in the Diagram Book.

It shows a grid.

The cumulative frequency table below gives information about the distance, in kilometres, that each of **80** workers travel from home to work at Office **A**

Distance travelled (d km)	Cumulative frequency
$0 < d \leq 5$	10
$0 < d \leq 10$	30
$0 < d \leq 15$	50
$0 < d \leq 20$	70
$0 < d \leq 25$	77
$0 < d \leq 30$	80

(continued on the next page)

Turn over

12. continued.

   (a) On the grid in the Diagram Book, draw a cumulative frequency graph for the information in the table.

      (2 marks)

   (b) Use your graph to find an estimate for the median distance travelled.

      (1 mark)

      _____ km

   (c) Use your graph to find an estimate for the interquartile range of the distances travelled.

      (2 marks)

      _____ km

Turn over

12. **continued.**

For Office **B**, the median distance workers travel from home to work is **15 km** and the interquartile range is **5 km**

(d) Use the information above to compare the distances that workers at Office **A** and workers at Office **B** travel from home to work.

Write down TWO comparisons.

(2 marks)

1 _____

_____

_____

_____

_____

2 _____

_____

_____

_____

(Total for Question 12 is 7 marks)

_____

Turn over

13. Look at the diagram for Question 13 in the

Diagram Book.

It shows an incomplete probability tree.

Emilie takes part in two races.

The probability that she wins the first race is $0 \cdot 7$

The probability that she wins the second race

is $0 \cdot 4$

The outcomes of the two races are independent.

(a) Complete the probability tree diagram in the

Diagram Book.

There are four spaces to fill.

(2 marks)

Turn over

13. continued.

(b) Work out the probability that Emilie wins exactly one of the two races.

(3 marks)

_____

Turn over

13. continued.

Emilie is going to take part in a third race.

If she wins both of the first two races, the probability that she will win the third race is $0 \cdot 6$

If she wins exactly one of the first two races, the probability that she will win the third race is $0 \cdot 3$

(c)   Work out the probability that Emilie will win exactly two of the three races.

(3 marks)

Answer space continues on the next page.

13. (c) continued.

_____

(Total for Question 13 is 8 marks)

14. Simplify fully

$$\left(\frac{9x^4}{16y^{10}}\right)^{-\frac{1}{2}}$$

(Total for Question 14 is 3 marks)

15. (a) Complete the table of values for

$$y = \frac{1}{x}(x^2 + 4)$$

There are four spaces to fill.

(2 marks)

x	y
0·25	16·25
0·5	
1	
2	
4	
8	8·5

(continued on the next page)

Turn over

15. continued.

(b) Look at the diagram for Question 15(b) in the Diagram Book.

It shows a grid.

On the grid, draw the graph of

$$y = \frac{1}{x}(x^2 + 4) \text{ for } 0{\cdot}25 \leq x \leq 8$$

(2 marks)

(Total for Question 15 is 4 marks)

Turn over

16. **A** is inversely proportional to the square of **r**

Given that

$$A = 5 \text{ when } r = 0 \cdot 3$$

(a)   find a formula for **A** in terms of **r**

(3 marks)

_____

Turn over

16. continued.

    Remember:

    A is inversely proportional to the square of **r**

    (b) Find the value of **A** when **r = 7·5A**

    (3 marks)

    Answer space continues on the next page.

16. (b) continued.

A = _____

(Total for Question 16 is 6 marks)

Turn over

17. The straight line **L** passes through the points $(4, -1)$ and $(6, 4)$

The straight line **M** is perpendicular to **L** and intersects the y−axis at the point $(0, 8)$

Find the coordinates of the point where **M** intersects the x−axis.

(4 marks)

Answer space continues on the next page.

17. **continued.**

(_____ , _____)

(Total for Question 17 is 4 marks)

18. Look at the diagram for Question 18 in the Diagram Book.

It is NOT accurately drawn.

ABCD is a quadrilateral where A, B, C and D are points on a circle.

AB = 8 cm

BC = 7·5 cm

Angle ABC = 98°

Angle ACD = 35°

Work out the perimeter of quadrilateral ABCD

Give your answer correct to one decimal place.

(6 marks)

Answer space continues on the next three pages.

18. continued.

18. **continued.**

18. continued.

_____ **cm**

(Total for Question 18 is 6 marks)

19. **Solve the simultaneous equations**

$$y = 3 - 2x$$
$$x^2 + y^2 = 18$$

Show clear algebraic working.

(5 marks)

Answer space continues on the next two pages.

19. **continued.**

19. **continued.**

(Total for Question 19 is 5 marks)

Turn over

20. Mathematically similar wooden blocks are made in a workshop.

    There are small blocks and there are large blocks.

    The volume of each small block is **300 cm^3**

    Given that

    the surface area of each small block : the

    surface area of each large block **= 25 : 36**

    work out the volume of each large block.

    (3 marks)

    Answer space continues on the next two pages.

20. **continued.**

20. continued.

_____ **cm³**

(Total for Question 20 is 3 marks)

Turn over

21. The point **A** is the only stationary point on the curve with equation

$$y = kx^2 + \frac{16}{x}$$ where **k** is a constant.

Given that the coordinates of **A** are

$$\left(\frac{2}{3}, n\right)$$

find the value of **n**

Show your working clearly.

(5 marks)

Answer space continues on the next two pages.

Turn over

21. continued.

21. continued.

n = _____

(Total for Question 21 is 5 marks)

Turn over

22. The curve S has equation $y = f(x)$ where $f(x) = x^2$

The curve T has equation $y = g(x)$ where

$g(x) = 2x^2 - 12x + 13$

By writing $g(x)$ in the form $a(x - b)^2 - c$,

where a, b and c are constants, describe fully a

series of transformations that map the curve S onto

the curve T

(4 marks)

Answer space and lines continue on the next two

pages.

Turn over

22. continued.

22. continued.

(Total for Question 22 is 4 marks)

23. Pippa has a box containing **N** pens.

There are only black pens and red pens in the box.

The number of black pens in the box is **3** more than the number of red pens.

Pippa is going to take at random **2** pens from the box.

The probability that she will take a black pen FOLLOWED by a red pen is $\dfrac{9}{35}$

Find the possible values of **N**

Show clear algebraic working.

(5 marks)

Answer space continues on the next three pages.

Turn over

23. **continued.**

23. continued.

23. continued.

_____

(Total for Question 23 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

END OF PAPER