

Every Topic on the AQA  
2022 Advanced Information  
Practice Booklet  
Paper 3 (Calculator)

Higher Tier



**GCSE**  
Maths Tutor



How it all Works!

Work through the practice booklet,  
scan the code, watch the live  
tutorial and check your answers!

**Try it out!**

Disclaimer: There is no guarantee that any specific topic will be examined this way in the summer and you cannot rely on this as your only source of revision. Please visit the YouTube channel for in depth lessons on each of the topics within this document along with any recommended revision that has been instructed by your education provider.

[www.thegcsemathstutor.co.uk](http://www.thegcsemathstutor.co.uk)

**Answer ALL questions.**  
**Write your answers in the spaces provided.**  
**You must write down all the stages of your working.**

1. Find the Highest Common Factor (HCF) of 24 and 108

.....  
(3 marks)

2. Pens come in packs of 8 and pencils come in packs of 20.  
Harris wants to buy the same amount of pens and pencils.  
What is the smallest amount of packs of each that he needs to buy?

Packs of pens .....  
Packs of pencils .....  
(3 marks)

3. 2.56 has been rounded to 3 significant figures.  
Write down the error interval.

.....  $\leq 2.56 <$  .....  
(2 marks)

4. James completes a maths question on his calculator, he writes down the first 3 digits on his calculator screen, the answer that he writes down is 24.8

Write down the error interval for his answer.

.....  $\leq x <$  .....  
(2 marks)

5. Write the following numbers in order of size. Start with the smallest number.

0.13 , 0.1 $\dot{3}$  , 0. $\dot{1}3\dot{1}$  , 0.13 $\dot{1}$  , 0. $\dot{1}\dot{3}$

.....  
(2 marks)

6. Sadia is going to buy a new car.

For the car, she can choose one body colour, one roof colour and one wheel type.

She can choose from:

19 different body colours

25 different wheel types

The total number of ways Sadia can choose the body colour and the roof colour and the wheel type is 3325

Work out the number of different roof colours that Sadia can choose from.

.....  
(3 marks)

7. Sketch the graph of  $y = 12 - x - x^2$ , showing any points of intersection with the coordinate axes.

.....  
(4 marks)

8. Expand and Simplify  $(x + 3)(x - 4)(x - 2)$

.....  
(3 marks)

9. a) Make  $x$  the subject of  $y = \sqrt{3x + 4}$

.....  
(2 marks)

b) Make  $x$  the subject of  $z = \frac{x+3}{x+5}$

.....  
(4 marks)

10. a) Factorise Fully  $8x^2 + 4xy$

.....  
(2 marks)

b) Factorise  $2x^2 - 9x + 10$

.....  
(3 marks)

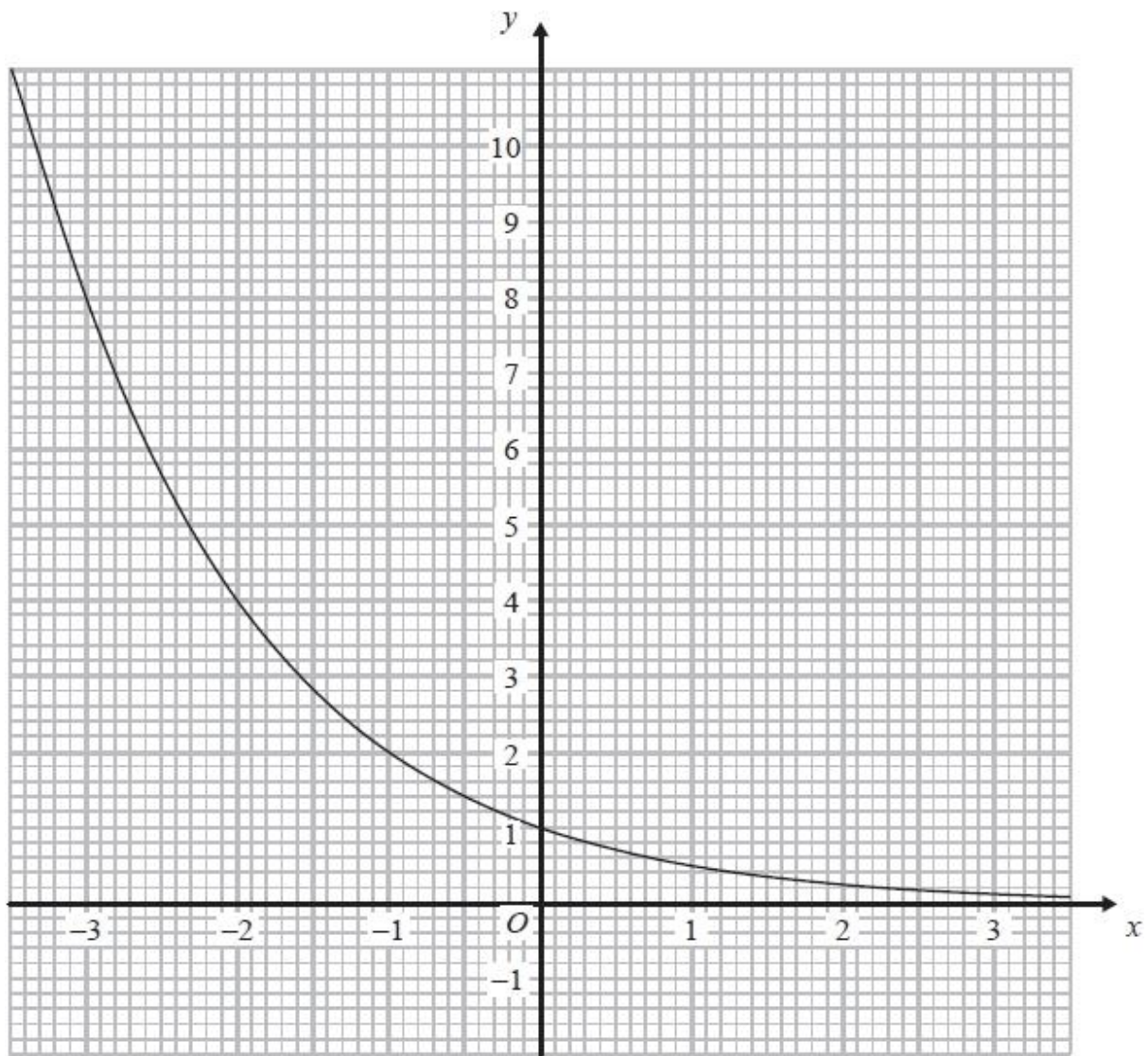
11. Find the coordinates of the turning point for the graph of  $y = 2x^2 - 10x + 8$

.....  
(4 marks)

12. By completing the square, state the coordinates of the turning point for the graph of  $y = 10 - 4x - x^2$

.....  
(4 marks)

13.



The graph of  $y = k^x$ , where  $k$  is a positive constant, is shown above.

Find the value of  $k$ .

.....  
(2 marks)

14. a) Given that  $f(x) = 2x + 5$  and  $g(x) = x^2 - 5$

Find the value of  $fg(3)$

.....  
(2 marks)

b) Given that  $f(x) = x^2 + 4$  and  $g(x) = 2x + 1$

Write down an expression for  $fg(x)$

.....  
(2 marks)

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15. Find the 50<sup>th</sup> term of the sequence 2 , 8 , 14 , 20 , 26

.....  
(2 marks)

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16. Find the nth term expression for the sequence 4 , 20 , 100 , 500

.....  
(2 marks)



17. Solve the simultaneous equations

$$x^2 + y^2 = 20$$

$$3x = 2 - y$$

.....  
(4 marks)

18. Frank, Lewis and James share some money in the ratio 2:4:3

James gets £90.

Work out how much Frank and Lewis receive.

Frank .....

Lewis .....

(3 marks)

19. Frank invests £8,000 for 3 years in a savings account.

He was paid 2.4% compound interest in the first year and 0.5% compound interest per annum for each year after.

How much did Frank have in his savings account after 3 years?

.....  
(3 marks)

20. Ava invested £8,000 for 3 years in a savings account.

She was paid  $x\%$  per annum compound interest.

At the end of the 3 years she had £8,589.93 in the account.

Work out the value of  $x$ .

.....  
(3 marks)

21. Olly drove 56km from Liverpool to Manchester.

He then drove 61 km from Manchester to Sheffield.

Olly's average speed from Liverpool to Manchester was  $70\text{km/h}$

Olly took 75 minutes to drive from Manchester to Sheffield.

Work out Olly's average speed for his total drive from Liverpool to Sheffield.

.....  
(4 marks)

22. The area of a country is  $5000\text{km}^2$

The population density of the country is  $315\text{ people/km}^2$

Work out the population of the country

.....  
(2 marks)

23. The diagram shows the floor plan of Ben's dining room.

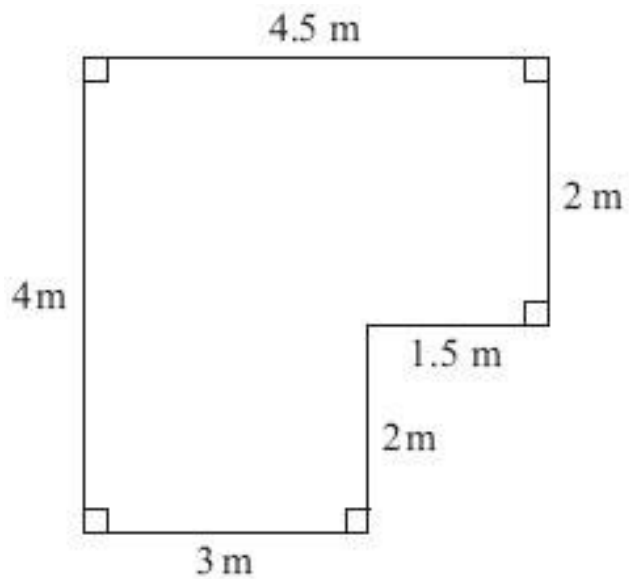


Diagram **NOT**  
accurately drawn

Ben is going to cover the floor with wooden floorboards.

The floorboards are sold in packs.

One pack of floorboards will cover  $2.25 \text{ m}^2$ .

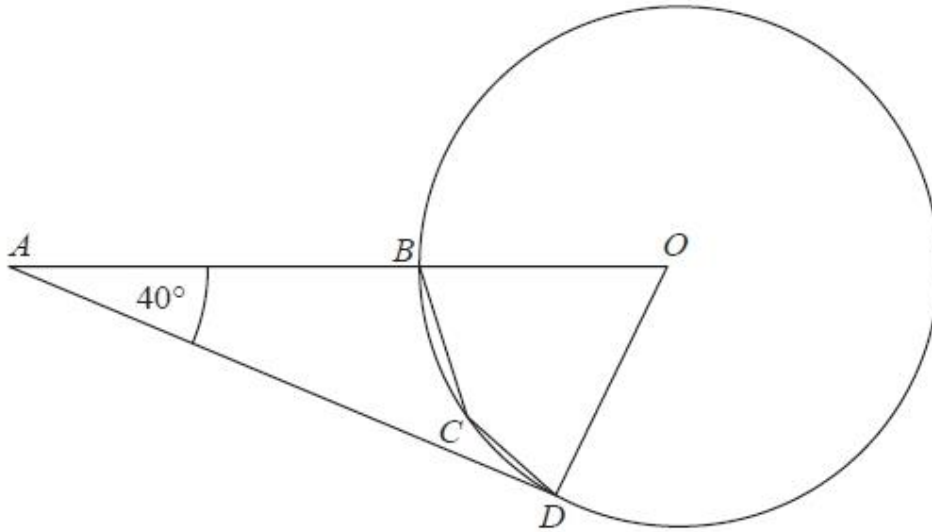
Work out how many packs Ben needs.

You must show all your working.

.....  
(4 marks)

24.

Diagram **NOT**  
accurately drawn



B, C and D are points on the circumference of a circle, centre O.

ABO is a straight line.

AD is the tangent at D to the circle.

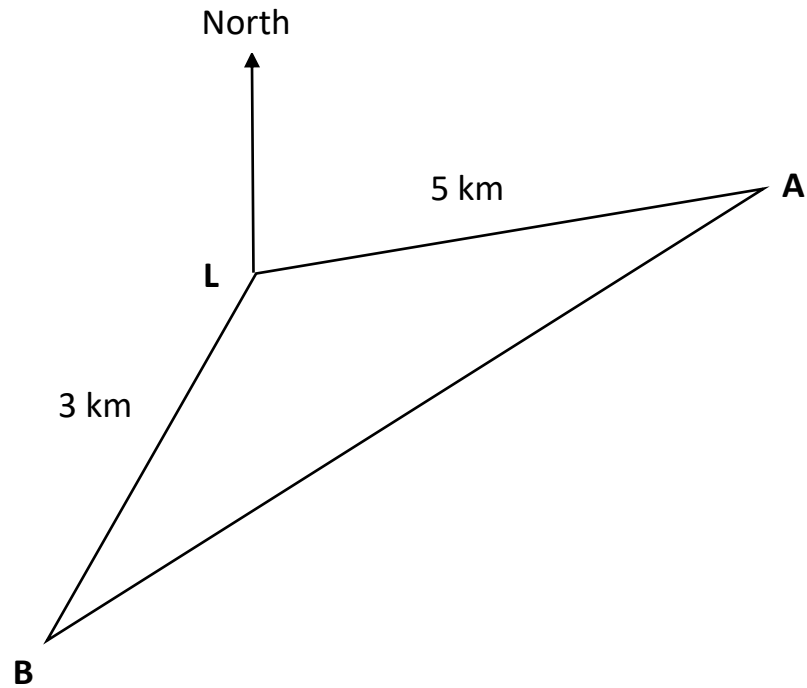
Angle  $DAO = 40^\circ$

Work out the size of angle BCD.

Give a reason for each stage of your working.

.....  
(5 marks)

25.



Two ships leave a lighthouse L.

Ship A is on a bearing of  $070^\circ$  from L.

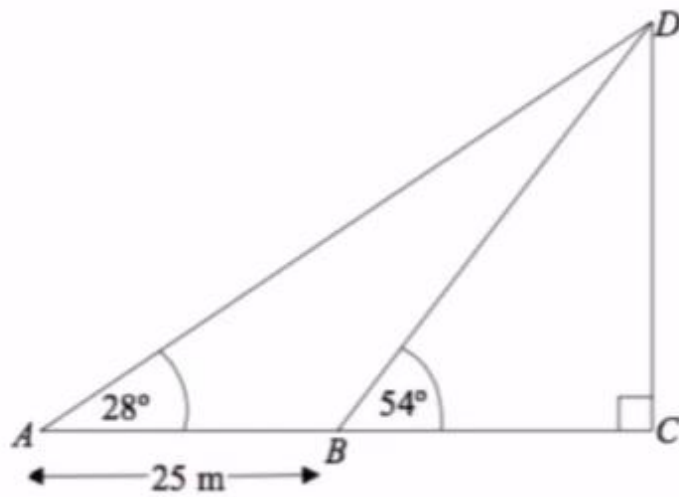
Ship B is on a bearing of  $210^\circ$  from L.

Calculate the distance between ship A and ship B.

Give your answer to 3 significant figures.

.....  
(4 marks)

26.



Angle  $DAB = 28^\circ$

Angle  $DBC = 54^\circ$

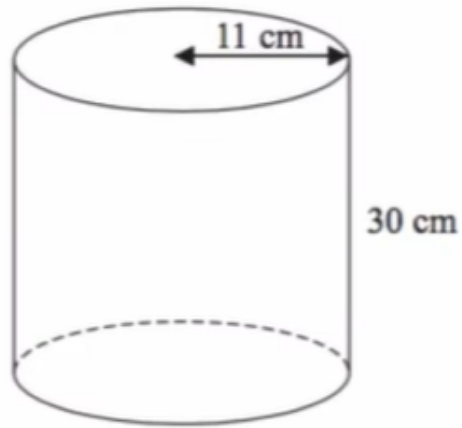
$AB = 25\text{m}$

$ABC$  is a straight line.

Work out the length  $DC$

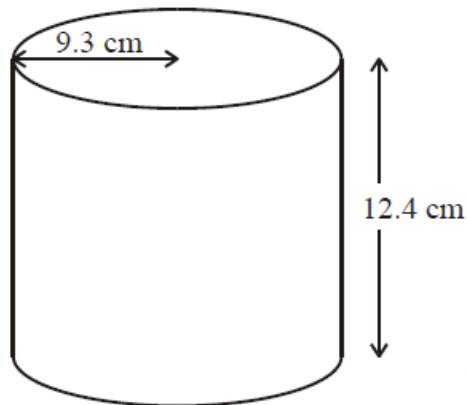
.....  
(4 marks)

27.



- a) Work out the volume of the cylinder.  
Give your answer to 3 significant figures.

.....  
(2 marks)



- b) Calculate the total surface area of the cylinder.  
Give your answer to 3 significant figures.

.....  
(3 marks)



28.  $a = \begin{pmatrix} 5 \\ 3 \end{pmatrix}$  and  $b = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$

Write down  $a + 2b$  as a column vector

.....  
(2 marks)

29. Josh gets the bus to and from school each day.

The probability that his bus is late to school is 0.14

The probability that his bus is late home is 0.32

Work out the probability that exactly one bus is late.

.....  
(4 marks)

30. There are 10 pens in a box.  
There are  $x$  red pens in the box.  
All the other pens are blue.

Jack takes at random two pens from the box.

Find an expression, in terms of  $x$ , for the probability that Jack takes one pen of each colour.

Give your answer in its simplest form.

.....  
(5 marks)

31. On an activity day students play one sport out of football, hockey or tennis.

There were 120 students.

30 of the students are boys.

12 of the 38 students who play hockey are boys.

35 of the 45 students who play football are girls.

One of the girls is chosen at random.

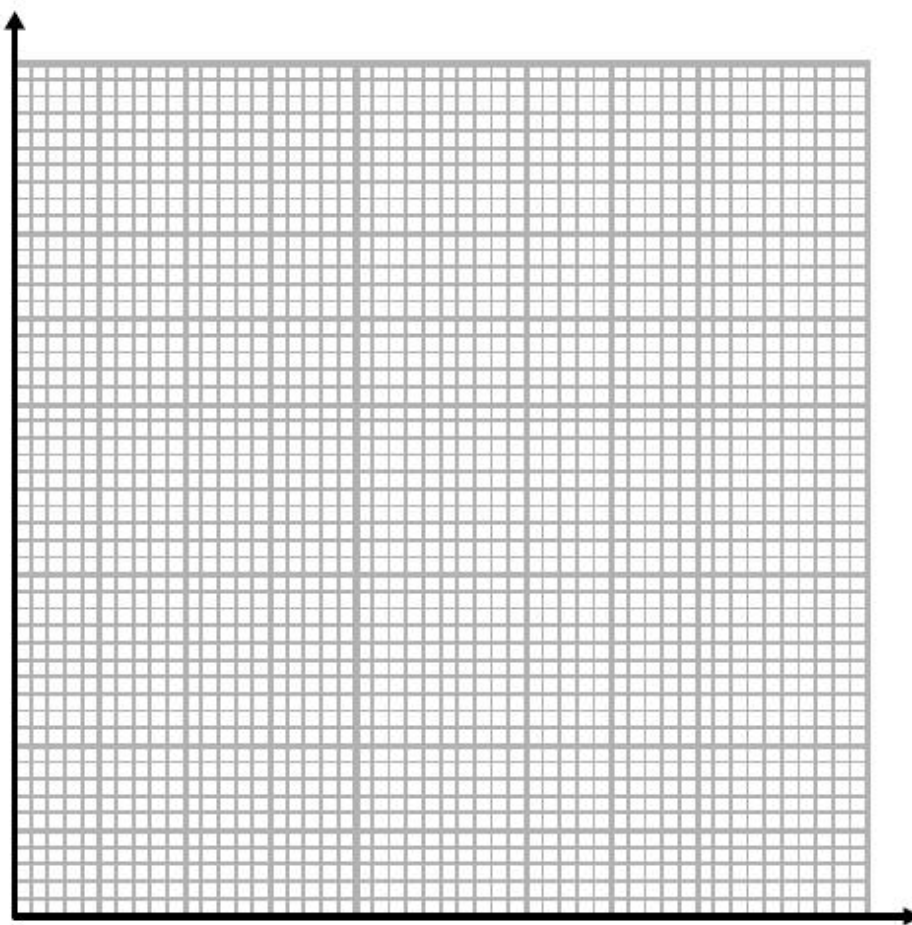
Write down the probability that they play tennis.

.....  
(4 marks)

32. The table gives information about the speeds, in km/h, of 81 cars.

Speed ( $s$ km/h)	Frequency
$90 < s \leq 100$	13
$100 < s \leq 105$	16
$105 < s \leq 110$	18
$110 < s \leq 120$	22
$120 < s \leq 140$	12

a) On the grid, draw a histogram for the information in the table.



(3 marks)

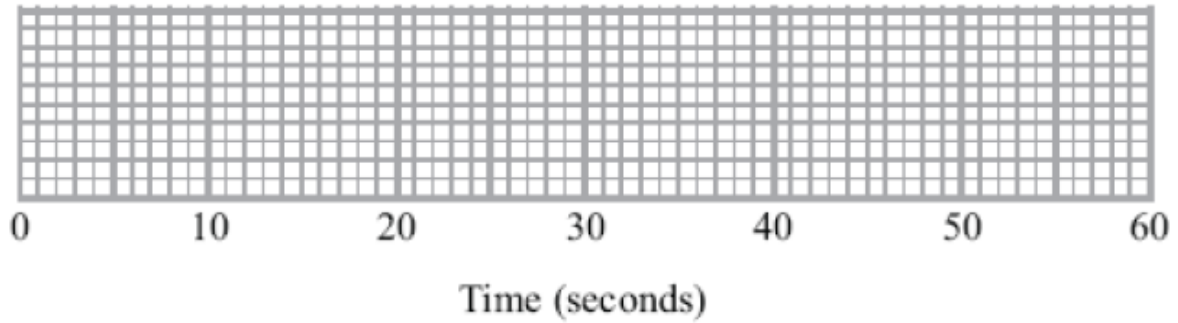
b) Find an estimate for the median.

.....  
(2 marks)

33. Here are the times, in seconds, that 15 people waited to be served at Rose's garden centre.

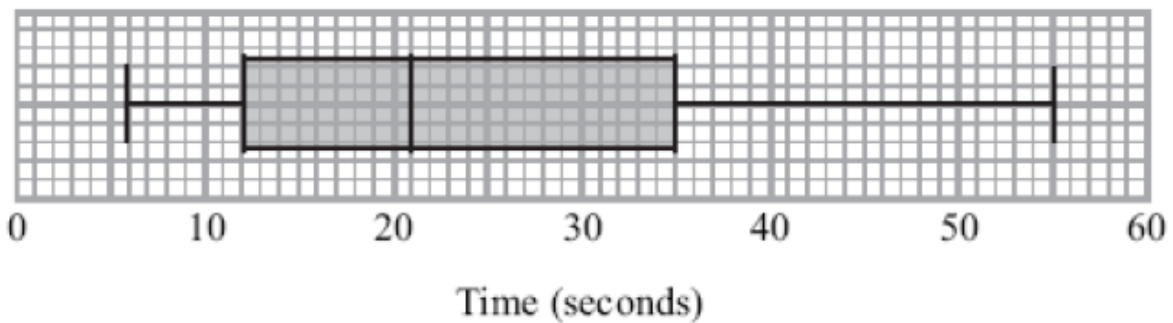
5 9 11 14 15 20 22 25 27 27 28 30 32 35 44

a) On the grid, draw a box plot for this information.



(3 marks)

The box plot below shows the distribution of the times that people waited to be served at Green's garden centre.



b) Compare the distribution of the times that people waited at Rose's garden centre and the distribution of the times that people waited at Green's garden centre.

.....

.....

.....

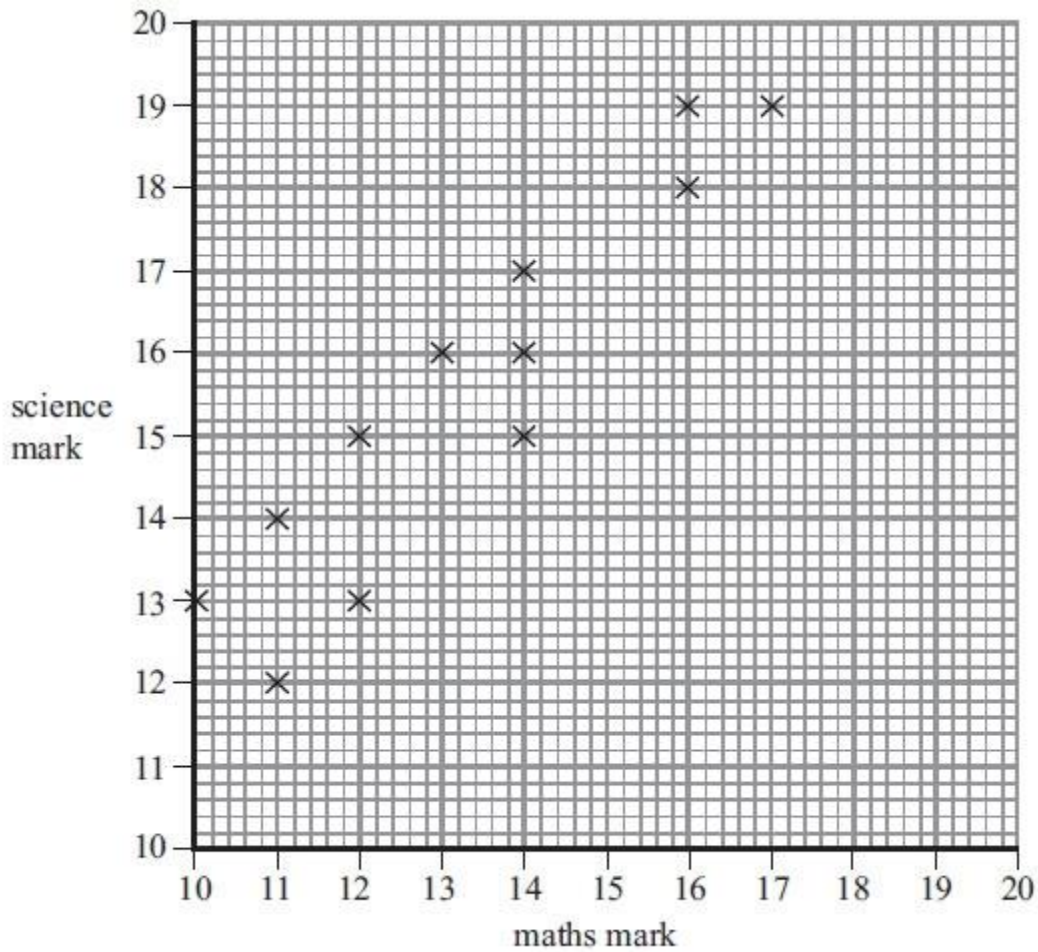
(2 marks)

34. The scatter graph shows the marks of 12 students tests.

The table shows the marks of 2 more students.

	Maths	Science
Student A	12	14
Student B	17	20

a) Show this information on the scatter graph.



(1 mark)

b) What type of correlation does this scatter graph show?

.....  
(1 mark)

c) Another student's mark in the maths test was 15.  
Estimate a science mark for the student.

.....  
(2 marks)

End of Paper