

Write your name here

Surname

Other names

achildsguideto.com

Level 1 / Level 2 GCSE

(9–1)

Centre Number

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Candidate Number

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Mathematics

Paper 1 (Non-Calculator)

Higher Tier

Exam Revision

Time: 1 hour 45 minutes

Paper Reference

1MA1/1H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used.**



Information

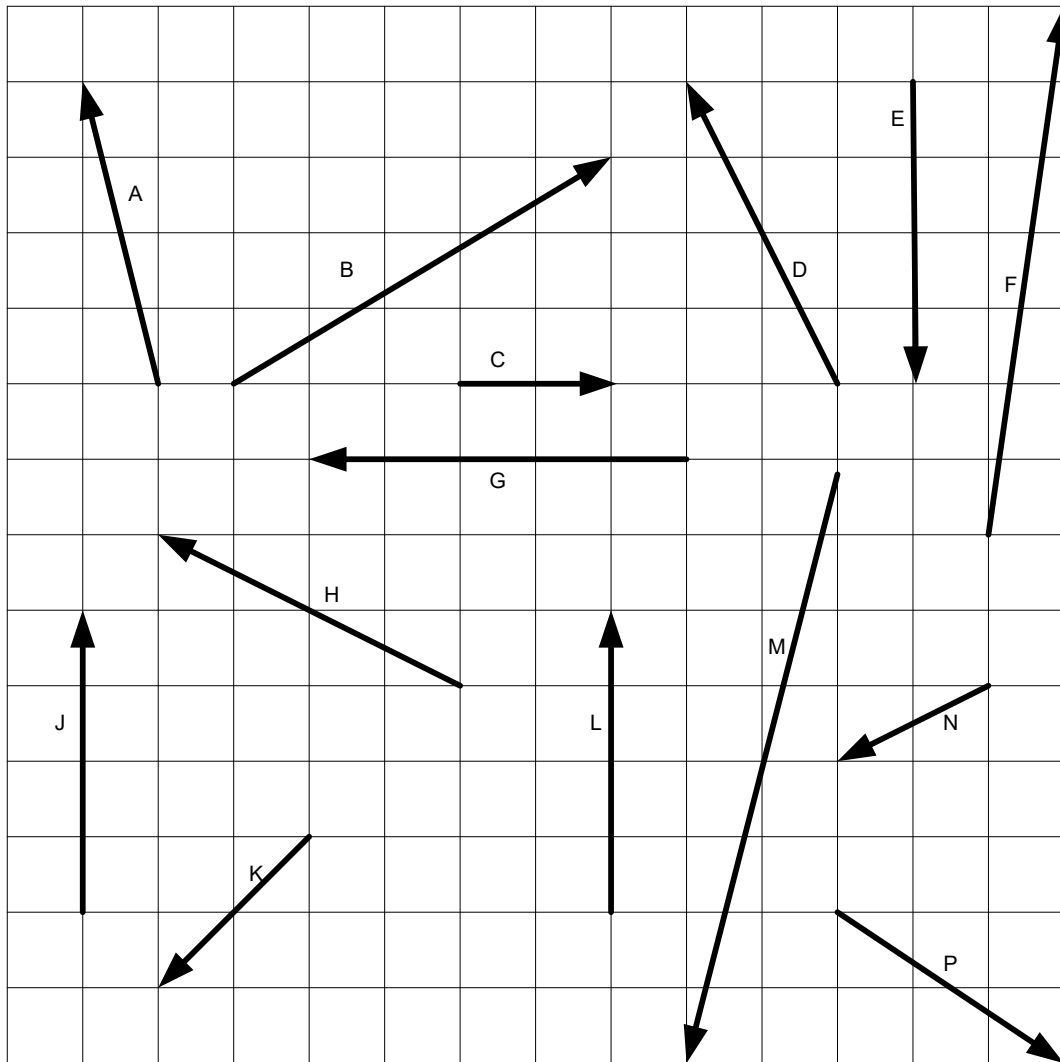
- The total mark for this paper is 94
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

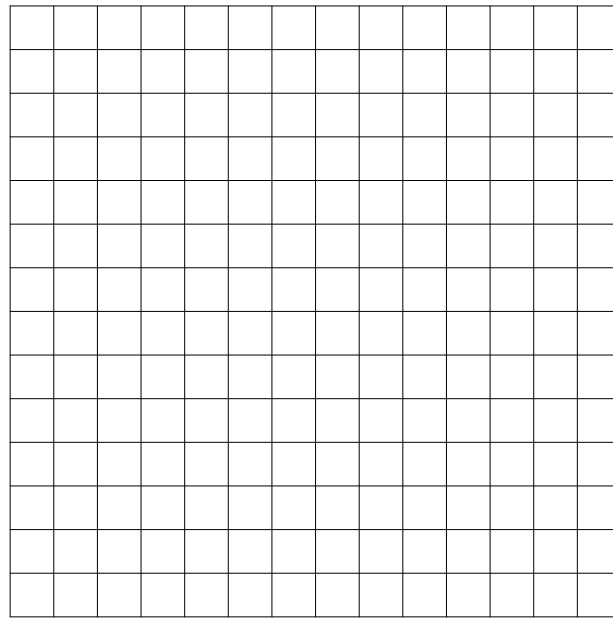
Q1 Vectors have been drawn onto a grid.



For each of the above vectors, write the column vector for each one. The first one has been done for you.

$$a = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$$

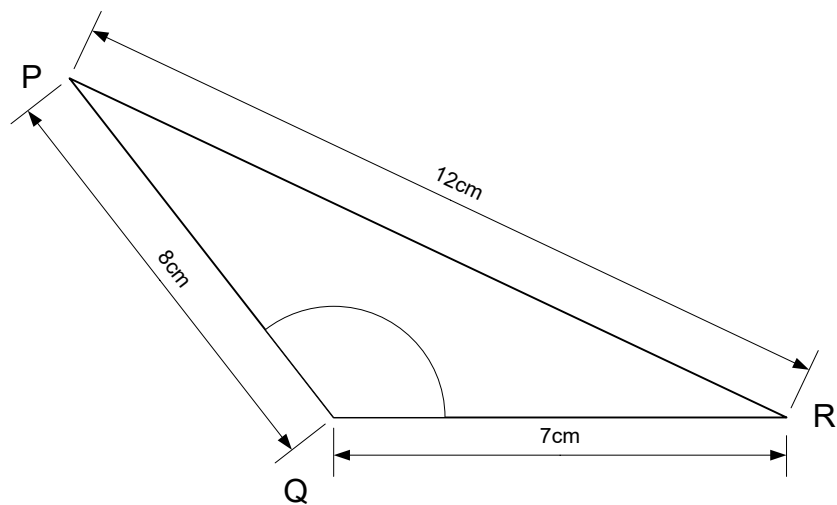
Q2 Refer back to Q1. On the grid below, draw the and label the vector $3\mathbf{n} + \mathbf{j}$.



.....

(3)

Q3 Find the size of angle PQR



.....

(3)

Q4 Here are the first three terms of an arithmetic sequence.

$$x - 5 \qquad x + 1 \qquad 2x$$

- (a) Find the value of the fourth term in this sequence?

.....

(3)

Here are the first six terms in a quadratic sequence.

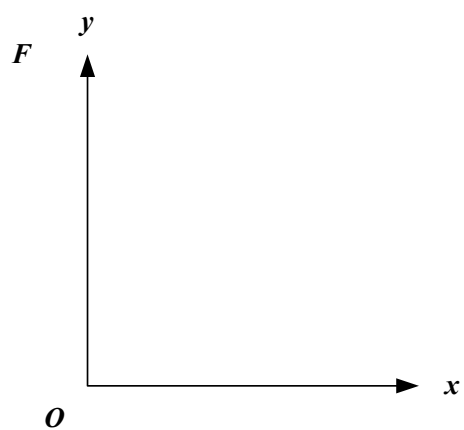
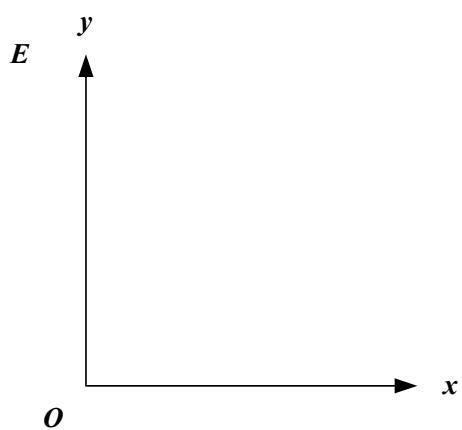
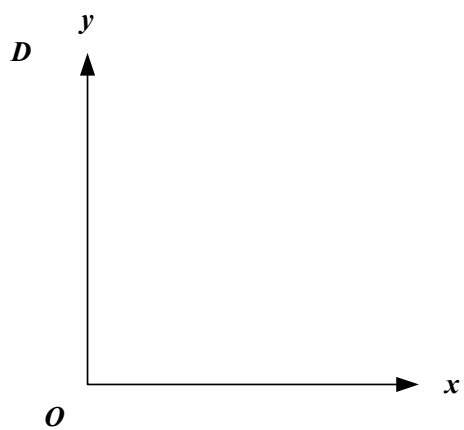
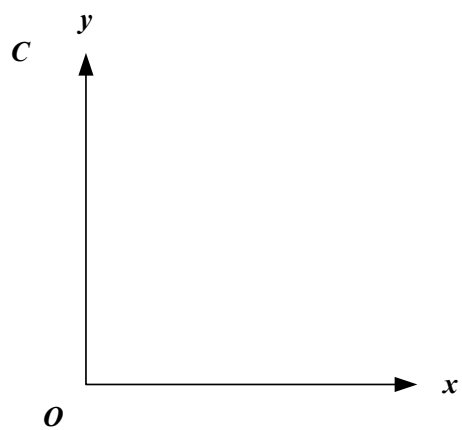
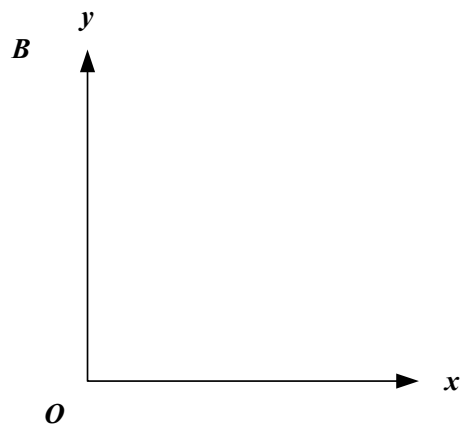
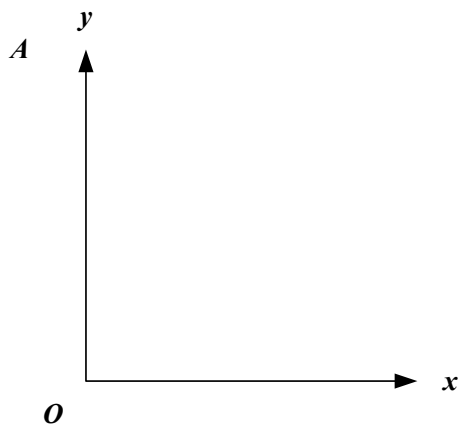
$$60 \qquad 73 \qquad 90 \qquad 111 \qquad 136 \qquad 165$$

- (b) Find an expression for the n th term in the sequence.

.....

(3)

Q5 On each of the sets of axes below, sketch the specified graph for values of $x > 0$.



A y is inversely proportional to x

B $y = x$

C $y = 2x + 1$

D $y = x^0$

E $y = -x$

F $y = e^x$

Q6 Functions f , g and h are such that

$$f(x) = \frac{5x}{12}$$

$$g(x) = 5x^2 + 7$$

$$h(x) = \frac{2}{x}$$

a Find $f(-4)$

.....
(1)

b Find $g(-4)$

.....
(1)

c Find $h(-4)$

.....
(1)

d Find $g(-4)$

.....
(1)

e Find $h^{-1}(-4)$

.....
(3s)

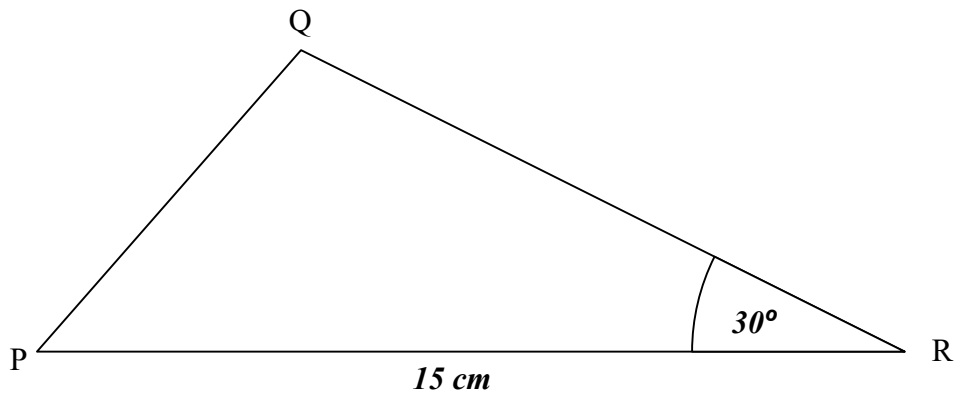
f Find $gf(-4)$

.....
(2)

g Find $hhgf(-4)$

.....
(3)

Q7 Here is a triangle, PQR.



The area of the triangle PQR is 25cm^2 .

Find the exact length of QR.

.....

(3)

Q8 Prove that if n is an integer, then $n^2 + n + 6$ is even

(4)

Q9 Three numbers: a , b and c are integers.

Prove that if a divides b and b divides c then a divides c .

Another way of writing this is:

Prove that if a is a factor of b and b is a factor of c then a is a factor of c .

(5)

Q10 Prove that the square of an odd number greater than 1 is always one more than a multiple of 8.

(4)

Q11 $\mathbf{a} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} -3 \\ -2 \end{pmatrix}$ $\mathbf{c} = \begin{pmatrix} 7 \\ -3 \end{pmatrix}$

Find the single vector that gives the solution to the following:

$$3\mathbf{a} + 2\mathbf{b} - 4\mathbf{c} =$$

.....

(3)

Q12 Solve $\frac{4}{x+1} + \frac{5}{2x-4} = 1$

.....

(4)

Q13 Write $\frac{5+3\sqrt{5}}{2+\sqrt{5}} + \frac{10}{\sqrt{5}}$ in the form $a + b\sqrt{5}$ where a and b are integers.

.....

(4)

Q14 Write $\frac{9+4\sqrt{7}}{6+\sqrt{7}} + \frac{21}{\sqrt{7}}$ in the form $a + b\sqrt{7}$ where a and b are integers.

.....

(4)

Q15 x is directly proportional to y^3
When $x=720, y=3$.
What is the value of x when $y=7$?

.....
(3)

Q16 x is directly proportional to $y^{-\frac{1}{2}}$
When $x=640, y=12$.
What is the value of x when $y=9$?

.....
(4)

Q17 Make r the subject of the equation below.

$$s = \frac{r}{r - 4}$$

.....

(3)

Q18 Make t the subject of the equation below.

$$s = ut + \frac{1}{2}at^2$$

.....

(5)

- Q19** The circle C has centre $(4,3)$.
The point A with co-ordinates $(9,5)$ lies on C .
The line l is the tangent to C at the point A .
The line l crosses the x -axis at point B .
Work out the area of triangle OAB where O is the origin.
You must show all your working.

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