

Question	1	2	3	4	5	6	7	8	9	Total
Marks										
Max Marks	6	6	7	4	4	3	5	6	5	46

Complete the following questions under exam conditions.

Time allowed: 50 minutes

Check and correct using the Mark Scheme.

Don't forget to drop into subject support with any remaining queries!

Question 1

(a)

Solve the inequality $2 - x < 1 + 3(x - 2)$. [3]

(b)

Solve the following.

$$-6 < 2x - 1 < 7 \quad [3]$$

Question 2

(i) Solve these simultaneous equations.

$$\begin{aligned} 3x + 4y &= 18 \\ 7x - 3y &= 5 \end{aligned} \quad [4]$$

(ii) Draw a rough sketch of the lines to demonstrate graphically the solution to part (i). [2]

Question 3

(i) Simplify the equation $\frac{x+a}{x} + \frac{x-2}{4} = 0$, leaving your answer in the form $(x+p)^2 = q$ where p is an integer and q is given in terms of the constant a . [3]

(ii) Hence write down the range of values of a for which the equation has real roots. [2]

(iii) Using your answer to part (i), solve the equation when $a = -1$, giving your answers **exactly**. [2]

Question 4

A car, P, accelerates from rest from a point O.

P accelerates uniformly at 2 ms^{-2} .

- (i) Write down the formula for the displacement, s metres, of P at time t seconds after leaving O. [1]
- (ii) Using appropriate units, find the time taken for P to reach a speed of 90 km h^{-1} . [3]

Question 5

Find the equation of the line which is perpendicular to the line with equation $2x + 3y = 4$ and which passes through the point $(3, -1)$. [4]

Question 6

The coordinates of A and B are $(1, 5)$ and $(-3, 7)$ respectively.

- (i) Calculate the **exact** length of AB. [2]
- (ii) Find the coordinates of the midpoint of AB. [1]

Question 7

- (i) Solve algebraically the simultaneous equations $y = 3 + 5x - x^2$ and $y = x + 7$. [4]
- (ii) Interpret your answer geometrically. [1]

Question 8

Four points have coordinates $A(-5, -1)$, $B(0, 4)$, $C(7, 3)$ and $D(2, -2)$.

- (i) Using gradients of lines, prove that ABCD is a parallelogram. [2]
- (ii) Using lengths of lines, prove further that ABCD is a rhombus. [2]
- (iii) Prove that ABCD is not a square. [2]

Question 9

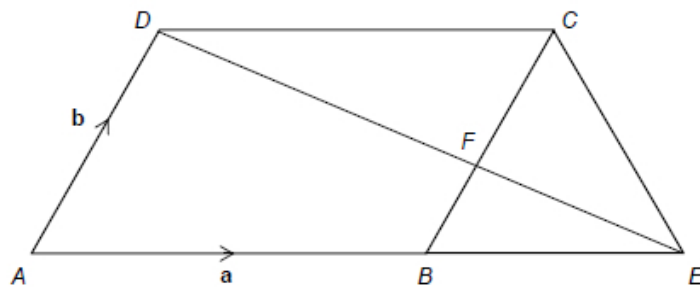
$ABCD$ is a parallelogram.

ABE is a straight line and $AB : BE = 3 : 2$.

BC and ED intersect at F .

$\vec{AB} = \mathbf{a}$ and $\vec{AD} = \mathbf{b}$.

Not drawn accurately



- (a) Work out \vec{ED} in terms of \mathbf{a} and \mathbf{b} .

Give your answer in its simplest form.

(3)

- (b) Deduce \vec{EF} in terms of \mathbf{a} and \mathbf{b} .

(2)

(5 marks)