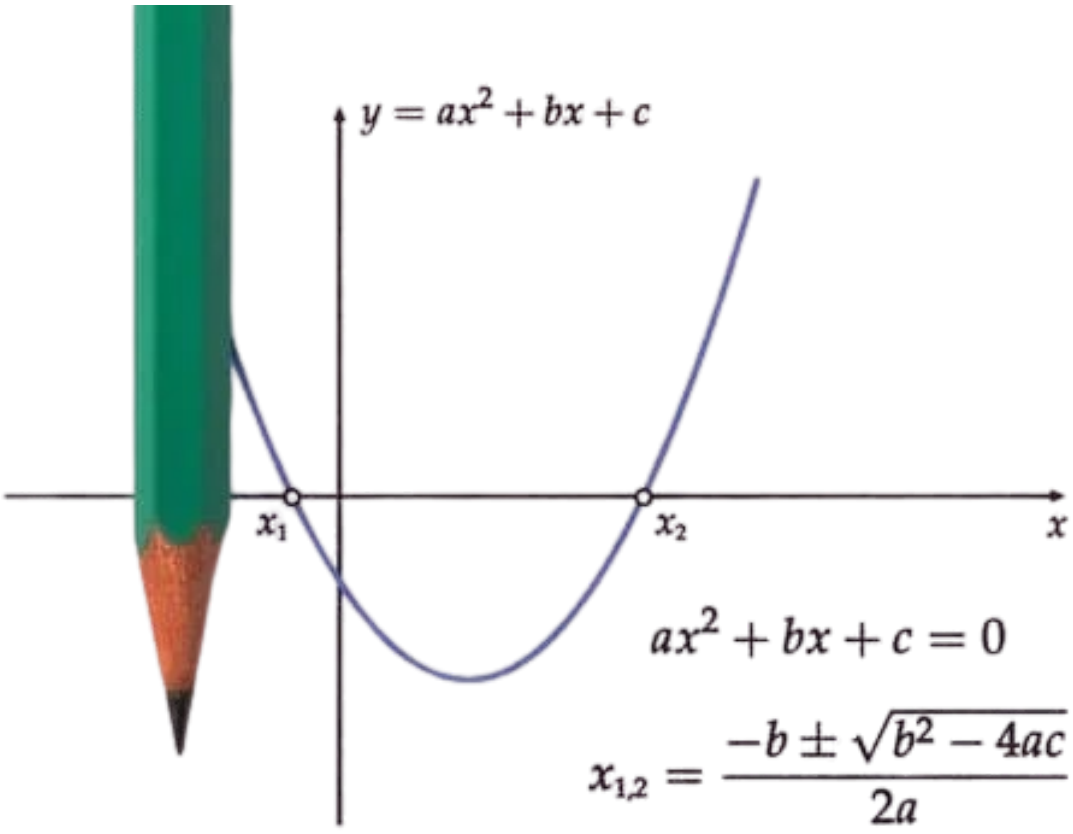
EDEXCEL IGCSE MATHEMATICS

PAPER 1H & 1HR (LINEAR)

GEOMETRY – QUADRATICS

QP & MS (2018 - 2025)



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EDEXCEL IGCSE MATHEMATICS MODULAR FOR MAY & OCT 2026

by Sir Muhammad Abdullah Shah

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1.Nov 2025 1H/Q21

Express $5x^2 - 20x + 23$ in the form $a(x - b)^2 + c$ where a, b and c are integers.

.....

(Total for Question 21 is 3 marks)

2. June 2025 1H/Q 6b(ii)

(ii) Hence solve $y^2 - 11y + 30 = 0$

.....

(1)

3. June 2025 1HR/Q 8c

(c) (i) Factorise $y^2 - 10y + 21$

.....

(2)

(ii) Hence, solve $y^2 - 10y + 21 = 0$

.....

(1)

4. Nov 2024 1H/Q 8a

(a) (i) Factorise $x^2 + 5x - 24$

.....

(2)

(ii) Hence, solve $x^2 + 5x - 24 = 0$

.....

(1)

5. June 2024 1H/Q 25

$f(x) = 17 - 3x^2 + 12x$

Write $f(x)$ in the form $a - b(x - c)^2$ where a, b and c are constants.

$f(x) =$ .....

(Total for Question 25 is 4 marks)

6. June 2024 1HR/Q 20a, b

(a) Express $2x^2 - 11x + 9$ in the form $a(x - b)^2 - c$ where a, b and c are numbers to be found.

.....

(3)

The curve **C** has equation $y = 2(x - 3)^2 - 11(x - 3) + 9$

The point P is the minimum point on **C**

(b) Find the coordinates of P

(..... , ...)

(2)

(Total for Question 20 is 5 marks)

7. June 2024 1HR/Q7c

(c) (i) Factorise $x^2 - 2x - 63$

.....

(2)

(ii) Hence, solve $x^2 - 2x - 63 = 0$

.....

(1)

8. June 2023 1H/Q6d

(d) (i) Factorise $x^2 + 9x - 22$

.....

(2)

(ii) Hence solve $x^2 + 9x - 22 = 0$

.....

(1)

9. Jan 2023 1HR/Q16c

The function g is such that

$$g(x) = 5x^2 - 20x + 23$$

(c) Express $g(x)$ in the form $a(x - b)^2 + c$

.....

(3)

10. Jan 2023 1HR/Q8b

(b) (i) Factorise $y^2 - 3y - 18$

.....

(2)

(ii) Hence, solve $y^2 - 3y - 18 = 0$

.....

(1)

11. June 2022 1H/Q24

Express each of a, b and c in terms of q so that

$$q + 12x - qx^2$$

can be written as $a - b(x - c)^2$

$a =$ .....

$b =$ .....

$c =$ .....

(Total for Question 24 is 4 marks)

12. June 2022 1HR/Q5bii

(ii) Hence, solve $x^2 + 8x - 9 = 0$

.....

(1)

13. June 2022 1HR/Q23a,b

(a) Express $2x^2 - 12x + 3$ in the form $a(x + b)^2 + c$ where a, b and c are integers.

.....

(3)

The curve **C** has equation $y = 2(x + 4)^2 - 12(x + 4) + 3$

The point M is the minimum point on **C**

(b) Find the coordinates of M

(..... , ...)

(2)

(Total for Question 23 is 5 marks)

14. Jan 2022 1H/Q6bii

(ii) Hence, solve $y^2 - 2y - 35 = 0$

.....

(1)

15. Jan 2022 1H/Q20a,b

(a) Express $7 + 12x - 3x^2$ in the form $a + b(x + c)^2$ where a, b and c are integers.

.....

(3)

C is the curve with equation $y = 7 + 12x - 3x^2$
The point A is the maximum point on **C**

(b) Use your answer to part (a) to write down the coordinates of A

(..... , ...)

(1)

(Total for Question 20 is 4 marks)

16. Jan 2022 1HR/Q 19b

Given that a, b and c are integers,

(b) express $3x^2 + 12x + 19$ in the form $a(x + b)^2 + c$

.....

(2)

17. Nov 2021 1H/Q 17c

(c) Express $4x^2 - 8x + 7$ in the form $a(x + b)^2 + c$ where a, b and c are integers.

.....

(3)

18. May 2021 1H/Q9b

(b) Solve $(2x + 5)^2 = (2x + 3)(2x - 1)$

$x =$ .....

(3)

19. Jan 2021 1H/Q 9bii

(ii) Hence, solve $x^2 + 5x - 36 = 0$

.....

(1)

20. Jan 2021 1HR/Q 16b

(b) Express $x^2 - 10x + 40$ in the form $(x + a)^2 + b$, where a and b are integers.

.....

(2)

21. Nov 2020 1H/Q7c

(c) (i) Factorise $y^2 - 2y - 48$

.....

(2)

(ii) Hence, solve $y^2 - 2y - 48 = 0$

.....

(1)

22. Jan 2020 1HR/Q 6

Solve $x^2 - 5x - 36 = 0$
Show clear algebraic working.

.....

(Total for Question 6 is 3 marks)

23. June 2019 1H/Q22bi

(b) (i) Write $x^2 - 6x + 10$ in the form $(x - a)^2 + b$ where a and b are integers.

.....

(2)

24. June 2018 1H/Q3d

(d) (i) Factorise $x^2 + 2x - 24$

.....

(2)

(ii) Hence, solve $x^2 + 2x - 24 = 0$

.....

(1)

25. June 2018 1H/Q11b

(b) Solve $3x^2 + 6x - 5 = 0$
Show your working clearly.
Give your solutions correct to 3 significant figures.

.....

(3)

26. June 2018 1HR/Q16a,b

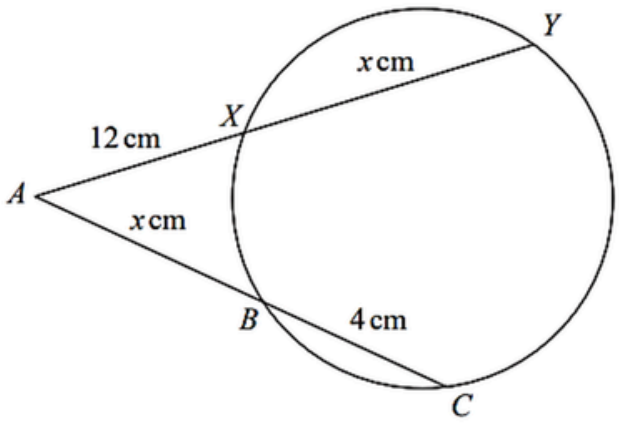

Diagram **NOT** accurately drawn

The points B, C, Y and X lie on a circle.

AXY and ABC are straight lines.

$AX = 12\,\text{cm}$ $XY = x\,\text{cm}$ $AB = x\,\text{cm}$ $BC = 4\,\text{cm}$

(a) Show that $x^2 - 8x - 144 = 0$

(3)

(b) Find the length of AC.
Show your working clearly.
Give your answer correct to 3 significant figures.

..... cm

(4)

(Total for Question 16 is 7 marks)

27. Sample 2018 1H/Q6b

(b) Solve $x^2 - 4x - 12 = 0$

Show clear algebraic working.

.....

(3)

MARKING SCHEME

1. Nov 2025 1H/Q21

21	$5(x-2)^2$ ..... **or** $5\left[(x-2)^2 .....\right]$ **or** $5\left(x+\frac{-20}{5\times 2}\right)^2+....$ **or** $5(x-b)^2+c$		3	M1	for a start to completing the square **or** correct substitution into $a\left(x+\frac{b}{2a}\right)^2+....$ from the formula $a\left(x+\frac{b}{2a}\right)^2-\frac{(b)^2}{4a}+c$ **or** $a=5$ embedded in an incorrect final answer in the form $5(x-d)^2+e$ (must be these signs)
	$5\left[(x-2)^2-2^2\right]$..... **or** $5\left[(x-2)^2-4\right]$..... **or** $5\left[(x-2)^2-2^2.....\right]$ **or** $5\left[(x-2)^2-4.....\right]$ **or** $5(x-2)^2-20$.....			M1	for correctly completing the square but terms do not need to be simplified and 23 may or may not be present correct simplification **or** of the first two parts of $a\left(x+\frac{b}{2a}\right)^2-\frac{(b)^2}{4a}(+c)$ **NB: Please refer to ALT mark scheme for comparison of coefficients method**
	Correct answer scores full marks (unless from obvious incorrect working)	$5(x-2)^2+3$		A1	oe eg $3+5(x-2)^2$ (if student continues to solve a quadratic equation, ISW)
					Total 3 marks

2. June 2025 1H/Q6b(ii)

(ii)		$(y=)\ 6,\ (y=)\ 5$	1	B1	must ft from their answer in (b)(i) ft from their factors in the form $(y+a)(y+b)$
					Total 6 marks

3. June 2025 1HR/Q8c

(c)(i)			2	M1	for $(y\pm 3)(y\pm 7)$ **or** for $(y\pm a)(y\pm b)$ with $ab=21$ or $a+b=-10$
	Correct answer scores full marks (unless from obvious incorrect working)	$(y-3)(y-7)$		A1	for correct factors
(ii)		3, 7	1	B1	ft dep on factorising in the form $(y\pm p)(y\pm q)$
					Total 5 marks

4. Nov 2024 1H/Q8a

8	(a)(i)	$(x\pm 8)(x\pm 3)$ or $x(x-3)+8(x-3)$ or $x(x+8)-3(x+8)$		2	M1 for $(x\pm 8)(x\pm 3)$ or $(x+a)(x+b)$ where $ab=-24$ or $a+b=5$ and, a and b are integers
		Correct answer scores full marks (unless from obvious incorrect working)	$(x+8)(x-3)$		A1 for $(x+8)(x-3)$ Allow any letter for x Must be in the form $(x+a)(x+b)$ where a and b are integers
	(ii)		–8 and 3	1	B1 must ft from their answer in (a)(i) ft from their incorrect factors in the form $(x+a)(x+b)$ Award B0 for –8 and 3 if no marks scored in (a)(i)

5. June 2024 1H/Q 25

25	$\pm 3(x^2 \pm 4x).....$ or $\pm 3(x^2 \pm 4x.....)$ or $b = 3$		4	M1 for factorising $-3x^2 + 12x$ or stating the correct value of b or $b = 3$ embedded in an incorrect final answer in the form $a - 3(x - c)^2$
	$-3[(x-2)^2 .....]$ or $-3(x-2)^2 .....$			M1 for a **correct** first step to complete the square
	$-3[(x-2)^2 - (2)^2].....$ oe or $-3(x-2)^2 + 12.....$ or $-3[(x-2)^2 - (2)^2 .....]$ oe			M1 for a **correct** second step to complete the square
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	$29 - 3(x-2)^2$		A1 oe eg $-3(x-2)^2 + 29$
				Total 4 marks

25 ALT	$-bx^2 + 2bcx - bc^2 + a$ oe or $b = 3$		4	M1 for multiplying out $a - b(x - c)^2$ or stating the correct value of b or $b = 3$ embedded in an incorrect final answer in the form $a - 3(x - c)^2$
	$2bc = 12$ or $a - bc^2 = 17$ oe			M1 for equating coefficients
	$2 \times$ "3" $\times c = 12$ or $a -$ "3" $\times$ "2"$^2 = 17$ oe			M1 for finding at least 2 from a or b or c
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	$29 - 3(x-2)^2$		A1 oe eg $-3(x-2)^2 + 29$
				Total 4 marks

6. June 2024 1HR/Q20a,b

20 (a)	$2\left(x^2 - \frac{11}{2}x\right) + ...$ **or** $2\left(x^2 - \frac{11}{2}x + ...\right)$ oe		3	M1	for taking out a factor of 2
	$2\left[\left(x - \frac{11}{4}\right)^2 - \frac{11^2}{4^2}\right] + ...$ **or** $2\left[\left(x - \frac{11}{4}\right)^2 - \frac{11^2}{4^2} + ...\right]$ oe			M1	for correctly completing square
	Correct answer scores full marks (unless from obvious incorrect working)	$2\left(x - \frac{11}{4}\right)^2 - \frac{49}{8}$		A1	oe, eg $2(x-2.75)^2 - 6.125$ allow $a = 2$, $b = \frac{11}{4}$ oe, $c = \frac{49}{8}$ oe if no other marks awarded, award SCB1 for $2\left(x - \frac{11}{4}\right)^2 + ...$
	ALTERNATIVE				
ALT (a)	$ax^2 - 2bax + b^2a - c$		3	M1	for correctly expanding $a(x - b)^2 - c$ to give $ax^2 - 2bax + b^2a - c$
	$-2ba = -11$ or $2ba = 11$ and $b^2a - c = 9$			M1	for setting up 2 equations using the coefficient of x and the numerical term
	Correct answer scores full marks (unless from obvious incorrect working)	$2\left(x - \frac{11}{4}\right)^2 - \frac{49}{8}$		A1	oe, eg $2(x-2.75)^2 - 6.125$ allow $a = 2$, $b = \frac{11}{4}$ oe, $c = \frac{49}{8}$ oe if no other marks awarded, award SCB1 for $2\left(x - \frac{11}{4}\right)^2 + ...$
(b)		$\left(\frac{23}{4}, -\frac{49}{8}\right)$	2	B2ft	oe, eg (5.75, −6.125)
				(B1ft	for one correct coordinate)
					Total 5 marks