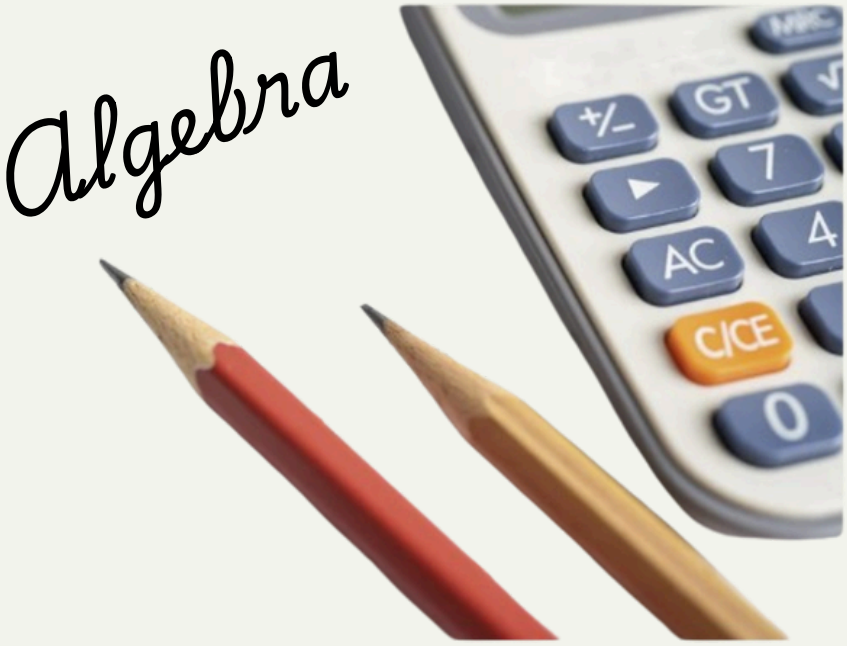
# EDEXCEL IGCSE MATHEMATICS

## UNIT 1 (MODULAR)

## ALGEBRA – MANIPULATION

QP & MS (2018 – 2025)




**COMPILED BY:**
**SIR MUHAMMAD ABDULLAH SHAH**

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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/Q14a,b**

(a) Expand and simplify $7x(3x + 2)(2x - 5)$

.....

(3)

(b) Solve $\frac{9}{2y} + \frac{5}{7} = 5$

Show clear algebraic working.



$y =$ .....

(3)

**(Total for Question 14 is 6 marks)**

**2. Nov 2025 1H/Q23**

$a = \dfrac{2x+5}{1-x} \quad x = \dfrac{5-2y}{3y}$

Write $a$ in the form $\dfrac{m+ny}{p(y-1)}$ where $m$, $n$ and $p$ are integers.

Show your working clearly.



$a =$ .....

**(Total for Question 23 is 3 marks)**

**3. June 2025 1H/Q6b(i)**

(b) (i) Factorise $y^2 - 11y + 30$

.....

(2)

**4. June 2025 1H/Q12**

Express $\frac{5}{4} + \frac{x-3}{6x}$ as a single fraction in its simplest form.



.....

**(Total for Question 12 is 3 marks)**

**5. June 2024 1H/Q12b**

(b) Express $\frac{2x+1}{4x} + \frac{7-5x}{3x}$ as a single fraction in its simplest form.



.....

(3)

**6. Nov 2023 1H/Q11**

Express $\frac{3}{4}+\frac{5-x}{6x}$ as a single fraction in its simplest terms.



.....

**(Total for Question 11 is 3 marks)**

**7. June 2023 1HR/Q23**

Simplify $(x^2 - 4) \div \left(\frac{4x^2 - 7x - 2}{x}\right) - 2x$

Give your answer in the form $\frac{ax^2}{bx + c}$ where $a$, $b$ and $c$ are integers.



.....

**(Total for Question 23 is 4 marks)**

**8. June 2022 1H/Q11b**

(b) Express $\frac{7}{8} - \frac{x+3}{4x}$ as a single fraction in its simplest form.

.....

(3)

**9. May 2021 1H/Q21**

Given that $x = \dfrac{5}{9y+5}$ and that $y = \dfrac{5}{5a-2}$

find an expression for $x$ in terms of $a$.
Give your expression as a single fraction in its simplest form.



.....

**(Total for Question 21 is 4 marks)**

**10. Jan 2021 1H/Q12**

(a) Express $\frac{4}{x-2} - \frac{3}{x+1}$ as a single fraction.

Give your answer in its simplest form.

.....

(3)

(b) Write $\frac{2x+1}{4} + \frac{x-2}{3}$ as a single fraction in its simplest form.



.....

(3)

**11. Nov 2020 1H/Q21**

Express

$$\frac{1}{3x-2} \times \frac{9x^2-4}{3x^2-13x-10} - \frac{7}{x-1}$$

as a single fraction in its simplest form.



.....

**(Total for Question 21 is 5 marks)**

**12. Jan 2019 1H/Q11**

Express $\frac{5}{3} - \frac{x+2}{2x}$ as a single fraction in its simplest terms.



**(Total for Question 11 is 3 marks)**

**13. Jan 2019 1HR/Q15d**

(d) Simplify fully $\dfrac{x^2 - 7x + 12}{4x - x^2}$

.....

(3)

# MARKING SCHEME

## 1. Nov 2025 1H/Q14a,b

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 (a) | eg $7x(3x+2)=21x^2+14x$ **or** $7x(2x-5)=14x^2-35x$ **or** $(3x+2)(2x-5)=6x^2-15x+4x-10$ $(=6x^2-11x-10)$ | | 3 | M1 | an expansion with only one error. Do not award this mark for $21x^2+14x+14x^2-35x$ **or** $(21x^2+14x)(14x^2-35x)$ | M2 for 3 (out of a maximum of 4) of $42x^3-105x^2+28x^2-70x$ |
| | eg $42x^3-105x^2+28x^2-70x$ **or** $42x^3-77x^2-70x$ | | | M1 | ft dep on M1 and a quadratic expression<br>allow one further error | (M1 for 2 correct out of a maximum of 4) |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | $42x^3-77x^2-70x$ | | A1 | if no working shown then award B2 for 2 terms out of a maximum of 3 terms correct<br>isw correct factorisation eg $7(6x^3-11x^2-10x)$ provided 3 marks has been awarded<br>do not isw incorrect simplification eg $42x^3-77x^2-70x=6x^3-11x^2-10x$ gets M2A0 | |
| (b) | eg $\frac{9\times7}{7\times2y}+\frac{5\times2y}{7\times2y}(=5)$ oe or $\frac{63}{14y}+\frac{10y}{14y}(=5)$ oe **or** $\frac{63+10y}{14y}(=5)$ oe **or** $\frac{9}{2y}=5-\frac{5}{7}$ **or** $\frac{9}{2y}=4\frac{2}{7}\left(=\frac{30}{7}\right)$ **or** $9+\frac{10y}{7}=10y$ **or** $\frac{63}{2y}+5=35$ | | 3 | M1 | for writing LHS correctly over the same common denominator<br>**or** for subtracting $\frac{5}{7}$ from both sides allow use of equivalent decimal 0.71(42…) for method marks<br>**or** multiplying through by $2y$<br>**or** multiplying through by 7 | |
| | eg $63+10y=70y$ oe **or** $63=60y$ oe **or** $\frac{63}{2}=30y$ **or** $2.1=2y$ **or** $2y=\frac{9}{30/7}$ oe | | | M1 | for a correct equation with all fractions removed **or** for a correct equation with $y$ isolated | |
| | *Working required* | 1.05 | | A1 | oe eg $\frac{63}{60}$ or $\frac{21}{20}$ dep on M1 | |
| | | | | | | **Total 6 marks** |

## 2. Nov 2025 1H/Q23

| | | | | | |
|---|---|---|---|---|---|
| 23 | $(a=)\dfrac{2\left(\frac{5-2y}{3y}\right)+5}{1-\left(\frac{5-2y}{3y}\right)}$ **or** $2\left(\frac{5-2y}{3y}\right)+5$ **and** $1-\left(\frac{5-2y}{3y}\right)$ | | 3 | M1 | writing both the numerator and denominator in terms of $y$, may be seen as one fraction or seen separately |
| | $(a=)\dfrac{2(5-2y)+5\times3y}{1\times3y-(5-2y)}$ **or** $(a=)\dfrac{10-4y+15y}{3y-5+2y}$ **or** $(a=)\dfrac{10+11y}{5y-5}$ **or** $(a=)\dfrac{\frac{2(5-2y)+5\times3y}{3y}}{\frac{1\times3y-(5-2y)}{3y}}$ **or** $(a=)\dfrac{\frac{10-4y+15y}{3y}}{\frac{3y-5+2y}{3y}}$ **or** $(a=)\dfrac{\frac{10+11y}{3y}}{\frac{5y-5}{3y}}$ **or** $(a=)\dfrac{2(5-2y)+5\times3y}{3y}\times\dfrac{3y}{1\times3y-(5-2y)}$ **or** $(a=)\dfrac{10-4y+15y}{3y}\times\dfrac{3y}{3y-5+2y}$ **or** $(a=)\dfrac{10+11y}{3y}\times\dfrac{3y}{5y-5}$ or | | | M1 | multiplying all terms by $3y$ or a multiple of $3y$ (some simplification may be present) **or**<br>writing numerator and denominator over $3y$ or a multiple of $3y$ **or**<br>multiplying the numerator by the reciprocal of the denominator where the numerator and denominator are separate fractions **or**<br>3 of $a$, $b$, $c$, $d$ correct if written in the form $\frac{a+by}{cy-d}$ or $\frac{a+by}{c(y-d)}$ where $a$, $b$, $c$ and $d$ are integers |
| | *Working required* | $\frac{10+11y}{5(y-1)}$ | | A1 | dep on M1 allow any equivalent fraction with integer values for $m$, $n$ and $p$ eg $\frac{30+33y}{15(y-1)}$ |
| | | | | | **Total 3 marks** |

### 3. June 2025 1H/Q6b(i)

| | | | | | |
|---|---|---|---|---|---|
| (b)(i) | $(y \pm 6)(y \pm 5)$ **or** $(6 \pm y)(5 \pm y)$<br>**or** $y(y-6)-5(y-6)$<br>**or** $y(y-5)-6(y-5)$ | | 2 | M1 | for $(y \pm 6)(y \pm 5)$ **or** $(6 \pm y)(5 \pm y)$ **or** for $(y+a)(y+b)$ where $ab = 30$ or $a+b=-11$<br>**or**<br>$y(y+a)+b(y+a)$ or $y(y+b)+a(y+b)$ where $ab = 30$ or $a+b=-11$ |

### 4. June 2025 1H/Q12

| | | | | | |
|---|---|---|---|---|---|
| **12** | eg $\frac{5(6x)}{24x}+\frac{4(x-3)}{24x}$ oe **or** $\frac{5(6x)}{4(6x)}+\frac{4(x-3)}{4(6x)}$ oe<br>**or** $\frac{30x}{24x}+\frac{4(x-3)}{24x}$ oe **or** $\frac{30x+4(x-3)}{24x}$ oe<br>**or** $\frac{15x}{12x}+\frac{2(x-3)}{12x}$ oe **or** $\frac{15x+2(x-3)}{12x}$ oe | | 3 | M1 | for two correct fractions with common denominator<br>**or**<br>a single correct fraction |
| | eg $\frac{30x+4x-12}{24x}$ oe **or** $\frac{30x}{24x}+\frac{4x-12}{24x}$ oe **or** $\frac{30x}{24x}+\frac{4x}{24x}-\frac{12}{24x}$ oe<br>**or** $\frac{34x}{24x}-\frac{12}{24x}$ oe **or** $\frac{34x-12}{24x}$ oe<br>**or** $\frac{15x+2x-6}{12x}$ oe | | | M1 | for correct fraction(s) with bracket(s) expanded correctly |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | $\frac{17x-6}{12x}$ | | A1 | oe but must be simplified<br>eg $\frac{-6+17x}{12x}$<br>do not ISW incorrect simplification<br>eg $\frac{17x-6}{12x}=\frac{11}{12}$ is M2A0 |
| | | | | | **Total 3 marks** |

### 5. June 2024 1H/Q12b

| | | | | |
|---|---|---|---|---|
| (b) | $\frac{3(2x+1)}{12x}+\frac{4(7-5x)}{12x}$ **or** $\frac{3x(2x+1)}{12x^2}+\frac{4x(7-5x)}{12x^2}$ **or** $\frac{3(2x+1)+4(7-5x)}{12x}$ oe **or** $\frac{3x(2x+1)+4x(7-5x)}{12x^2}$ oe | | 3 | M1 for two correct fractions with common denominator with the intention to add<br>**or**<br>a single correct fraction<br>NB $12x$ can be written as $(3)(4x)$ or $(4)(3x)$ for this mark<br>or<br>$12x^2$ can be written as $(3x)(4x)$ for this mark |
| | $\frac{6x+3+28-20x}{12x}$ oe or $\frac{6x^2+3x+28x-20x^2}{12x^2}$ oe or $\frac{31x-14x^2}{12x^2}$ oe | | | M1 for a correct single fraction with **all** brackets expanded |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | $\frac{31-14x}{12x}$ | | A1 or $\frac{14x-31}{-12x}$ |
| | | | | **Total 5 marks** |

## 6. Nov 2023 1H/Q11

| | | | | |
|---|---|---|---|---|
| 11 | $\frac{9x}{12x}+\frac{2(5-x)}{12x}$ oe or or $\frac{3(6x)}{24x}+\frac{4(5-x)}{24x}$ oe or $\frac{3(6x)}{4(6x)}+\frac{4(5-x)}{4(6x)}$ oe or or $\frac{18x}{24x}+\frac{20-4x}{24x}$ oe or $\frac{3\times3x+2(5-x)}{12x}$ oe | | 3 | M1 for two correct fractions with common denominator with the intention to add<br><br>**or**<br><br>a single correct fraction |
| | $\frac{9x+10-2x}{12x}$ oe or $\frac{18x+20-4x}{24x}$ oe or $\frac{14x+20}{24x}$ oe or | | | M1 for a correct numerator over a single denominator with brackets expanded and correct signs<br>Allow $\frac{7x}{12x}+\frac{10}{12x}$ |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | $\frac{7x+10}{12x}$ | | A1 oe $\frac{10+7x}{12x}$ |
| | | | | **Total 3 marks** |

## 7. June 2023 1HR/Q23

| | | | | |
|---|---|---|---|---|
| 23 | $\left(\frac{dy}{dx}=\right)16x-14$ | | 5 | M1 Differentiation to obtain 2 terms with at least 1 correct |
| | $16x-14=10$ | | | M1 their $dy/dx = 10$ dep on M1 |
| | (1.5, –9) or $x = 1.5$, $y = -9$ | | | A1 coordinates of point on curve at which gradient is 10 – allow given as coordinates or as $x$ worked out and $y$ worked out if meaning is clear |
| | eg $y--9=-\frac{1}{10}(x-\frac{3}{2})$ oe or<br>eg $-9=-\frac{1}{10}\times1.5+c$ oe | | | M1 A correct method to find the equation for line **Q** using (1.5, –9) |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | $2x + 20y + 177 = 0$ | | A1 oe where $a$, $b$, $c$ are integers eg $10x + 100y + 885 = 0$ |
| | | | | **Total 5 marks** |

## 8. June 2022 1H/Q11b

| | | | | |
|---|---|---|---|---|
| (b) | $\frac{7(4x)}{32x}-\frac{8(x+3)}{32x}$ oe or $\frac{7(4x)}{8(4x)}-\frac{8(x+3)}{8(4x)}$ oe or $\frac{28x}{32x}-\frac{8(x+3)}{32x}$ oe or $\frac{28x}{32x}-\frac{8x+24}{32x}$ oe or $\frac{28x-8(x+3)}{32x}$ oe or $\frac{7x}{8x}-\frac{2(x+3)}{8x}$ oe or $\frac{7x-2(x+3)}{8x}$ oe | | 3 | M1 for two correct fractions with common denominator<br>**or**<br>a single correct fraction |
| | $\frac{28x-8x-24}{32x}$ oe or $\frac{20x-24}{32x}$ oe or $\frac{7x-2x-6}{8x}$ oe or $\frac{20x}{32x}-\frac{24}{32x}$ oe or $\frac{28x}{32x}-\frac{8x}{32x}-\frac{24}{32x}$ oe | | | M1 for correct fraction(s) with bracket(s) expanded **and** dealing with the negative signs |
| | | $\frac{5x-6}{8x}$ | | A1 or $\frac{-6+5x}{8x}$ |
| | | | | **Total 5 marks** |

**9. May 2021 1H/Q21**

| | | | | | | |
|---|---|---|---|---|---|---|
| 21 | | $[x=]\ \dfrac{5}{9\left(\dfrac{5}{5a-2}\right)+5}$ oe **or** $y=\dfrac{5}{9x}-\dfrac{5}{9}$ oe | | 4 | M1 | A correct substitution for $y$ **or** writing $y$ in terms of $x$ |
| | | $[x=]\ \dfrac{5(5a-2)}{45+5(5a-2)}$ oe **or** $(5-5x)(5a-2)=45x$ oe **or** $9x=\dfrac{5(45a-18)}{35+25a}$ oe | | | M1 | Multiplying each term in the numerator and denominator by $(5a-2)$ to eliminate the fraction in the denominator **or** equating $y$'s and getting rid of fractions as far as shown on left **or** single fraction in terms of $a$ |
| | | $[x=]\ \dfrac{25a-10}{35+25a}$ oe **or** $[x=]\ \dfrac{5(5a-2)}{5(7+5a)}$ | | | M1 | A correct fraction not in simplest form with all brackets expanded **or** numerator and denominator factorised with the same common factor taken out |
| | | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | $x=\dfrac{5a-2}{7+5a}$ | | A1 | Correctly simplified $x=$ needed for the answer, or $x=$ previously seen in working with correct simplified expression<br><br>Do not isw if students have tried to do some incorrect cancelling<br>eg $x=\dfrac{5a-2}{7+5a}=\dfrac{-2}{7}$ gets M3A0 |
| | | | | | | **Total 4 marks** |

**10. Jan 2021 1H/Q12**

| | | | | | | |
|---|---|---|---|---|---|---|
| 12 | (a) | $\dfrac{4(x+1)-3(x-2)}{(x-2)(x+1)}$ **or** $\dfrac{4(x+1)}{(x-2)(x+1)}-\dfrac{3(x-2)}{(x-2)(x+1)}$ | | 3 | M1 | for expressing both fractions correctly with a common denominator. |
| | | $\dfrac{4x+4-3x+6}{(x-2)(x+1)}$ **or** $\dfrac{4x+4-3x+6}{x^2-x-2}$ | | | M1 | for removing brackets in a single fraction with a correct denominator. Allow denominator to be expanded. Allow one error in the expansion of the numerator. |
| | | | $\dfrac{x+10}{(x-2)(x+1)}$ | | A1 | accept $\dfrac{x+10}{x^2-x-2}$ oe |
| | b | E.g. $\dfrac{3(2x+1)+4(x-2)}{12}$ or $\dfrac{3(2x+1)}{12}+\dfrac{4(x-2)}{12}$ | | 3 | M1 | for expressing both fractions correctly with a common denominator.<br><br>Allow as two separate fractions. |
| | | E.g. $\dfrac{6x+3+4x-8}{12}$ | | | M1 | for removing brackets correctly in a correct single fraction |
| | | | $\dfrac{10x-5}{12}$ | | A1 | accept $\dfrac{5(2x-1)}{12}$ |

## 11. Nov 2020 1H/Q21

| | | | | | |
|---|---|---|---|---|---|
| 21 | $\left(\frac{9x^2-4}{3x^2-13x-10}=\right)\ \frac{(3x+2)(3x-2)}{(3x+2)(x-5)}$ | | | M1 for either $(3x+2)(3x-2)$ **or** $(3x+2)(x-5)$ | M2 for $\frac{9x^2-4}{(9x^2-4)(x-5)}=\frac{1}{(x-5)}$ |
| | $\left(\frac{9x^2-4}{3x^2-13x-10}=\right)\ \frac{(3x+2)(3x-2)}{(3x+2)(x-5)}$ | | | M1 for $(3x+2)(3x-2)$ **and** $(3x+2)(x-5)$ | |
| | E.g. of denominators<br>$(3x-2)(3x^2-13x-10)(x-1)$ **or**<br>$(3x-2)(3x+2)(x-5)(x-1)$ **or**<br>$9x^4-54x^3+41x^2+24x-20$ **or**<br>$(3x+2)(x-5)(x-1)$ **or** $3x^3-16x^2+3x+10$ **or**<br>$(3x-2)(x-5)(x-1)$ **or** $3x^3-20x^2+27x-10$ **or**<br>$(x-5)(x-1)$ **or** $x^2-6x+5$ | | | M1 (indep) ft their fractions for use of a correct common denominator for 2 fractions with **algebraic** denominators<br>NB: fractions need not be simplified | |
| | $\frac{x-1-7(x-5)}{(x-5)(x-1)}$ **or** $\frac{x-1-7x+35}{(x-5)(x-1)}$ **or**<br>$\frac{x-1-7(x-5)}{x^2-6x+5}$ **or** $\frac{x-1-7x+35}{x^2-6x+5}$ oe | | | M1 for a **correct** fraction with a **correct quadratic** denominator – may or may not be expanded which leads to a correct answer | |
| | | $\frac{2(17-3x)}{(x-5)(x-1)}$ | 5 | A1 accept $\frac{34-6x}{(x-5)(x-1)}$ oe; if denominator is expanded then it must be correct | |
| | | | | | **Total 5 marks** |

## 12. Jan 2019 1H/Q11

| Question | Working | Answer | | Mark | Notes |
|---|---|---|---|---|---|
| 11 | E.g. $\frac{10x}{6x}-\frac{3(x+2)}{6x}$ or $\frac{10x-3(x+2)}{6x}$ | | | M1 | for two correct fractions with common denominator **or** a single correct fraction |
| | $\frac{10x-3x-6}{6x}$ **or** $\frac{7}{6x}-\frac{1}{x}$ | | | M1 | for a correct single fraction with brackets expanded |
| | | $\frac{7x-6}{6x}$ | 3 | A1 | for $\frac{7x-6}{6x}$ as the final answer<br>SC: If no marks awarded then award B1 for an answer of $\frac{7x+6}{6x}$ |

## 13. Jan 2019 1HR/Q15d

| | | | | | |
|---|---|---|---|---|---|
| (d) | $\frac{(4-x)(3-x)}{x(4-x)}$ or $\frac{(x-4)(x-3)}{x(4-x)}$ | $\frac{3-x}{x}$ | 3 | M1 | for either numerator or denominator factorised correctly |
| | | | | M1 | for both numerator and denominator factorised correctly |
| | | | | A1 | oe |