EDEXCEL IGCSE MATHEMATICS

UNIT 1 (MODULAR)

ALGEBRA – INDICES

QP & MS (2018 – 2025)

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1. June 2025 1H/Q4c

(c) Simplify $(5a^4r^2)^3$

.....

(2)

2. June 2025 1HR/Q8a,b

(a) Simplify $a^6 \times a^{10}$

.....

(1)

(b) Simplify $c^{30} \div c^{12}$

.....

(1)

3. Nov 2024 1H/Q3a

(a) Simplify $(p^3)^5$

.....

(1)

4. June 2024 1H/Q10

(a) Simplify $(2p)^0$ where $p > 0$

.....

(1)

$y^9 \times y^{-3} = y^n$

(b) Find the value of n

$n =$ .....

(1)

(c) Simplify fully $(5a^4c^2)^3$

.....

(2)

(Total for Question 10 is 4 marks)

5. June 2024 1HR/Q7a

(a) Simplify $g^9 \div g^2$

.....

(1)

6. June 2023 1H/Q6a,b

(a) Simplify $(2c^4d^7)^3$

.....

(2)

(b) Find the value of $5y^0$ where $y > 0$

.....

(1)

7. June 2023 1HR/Q6

(a) Simplify $m^{10} \div m^3$

.....

(1)

$k^n \times k^4 = k^{12}$

(b) Write down the value of n

$n =$ .....

(1)

(c) Simplify $(3x^6y^8)^2$

.....

(2)

(Total for Question 6 is 4 marks)

8. Jan 2023 1H/Q12

$3^{\frac{1}{2}} \times 3^{\frac{2}{5}} = 3^m$

(a) Work out the value of m

$m =$ .....

(1)

$5^{-10} \div 5^{-4} = 5^n$

(b) Work out the value of n

$n =$ .....

(1)

(Total for Question 12 is 2 marks)

9. June 2022 1H/Q9

(a) Simplify $8 \times (4t)^0$

.....

(1)

$x^6 \div x^{-5} = x^p$

(b) Find the value of p

$p =$ .....

(1)

(c) Simplify fully $(2k^2m^4)^3$

.....

(2)

(Total for Question 9 is 4 marks)

10. June 2022 1HR/Q9

Solve the inequality $3 - 4x \leqslant 11$

.....

(Total for Question 9 is 2 marks)

11. Jan 2022 1H/Q1a,b,c

(a) Simplify $a^7 \times a^4$

.....

(1)

(b) Simplify $w^{15} \div w^3$

.....

(1)

(c) Simplify $(8x^5y^3)^2$

.....

(2)

12. Jan 2022 1HR/Q9a,b

(a) Simplify $x^4 \times x^5$

.....

(1)

(b) Simplify $(4y^2)^3$

.....

(2)

13. Nov 2021 1H/Q1a

(a) Simplify $e^8 \div e^2$

.....

(1)

14. May 2021 1H/Q5c

Given that $\frac{w^5 \times w^n}{w^3} = w^{10}$

(c) work out the value of n.

$n =$ .....

(2)

(Total for Question 5 is 6 marks)

15. Jan 2021 1H/Q9a

(a) Simplify $(2x^3y^5)^4$

.....

(2)

16. Jan 2021 1HR/Q6b

(b) Write down the value of g^0

.....

(1)

17. Jan 2021 1HR/Q12a

(a) Simplify $(16e^{10}f^{6})^{\frac{1}{2}}$

.....

(2)

18. Nov 2020 1HR/Q3a

(a) Simplify $h^7 \times h^2$

.....

(1)

19. Jan 2020 1H/Q7c

(c) Simplify $(p^2 + 3)^0$

.....

(1)

20. Jan 2020 1HR/Q3d

(d) Simplify fully $\frac{n^4 \times n^7}{n^5}$

.....

(2)

21. June 2019 1H/Q3a,b

(a) Simplify $e^9 \div e^5$

.....

(1)

(b) Simplify $(y^2)^8$

.....

(1)

22. June 2019 1H/Q12c

(c) Write $\frac{\sqrt[4]{y}}{y}$ in the form y^b where b is a fraction.

.....

(2)

23. June 2019 1HR/Q9a,b,c

(a) Simplify $t^9 \div t^3$

.....

(1)

(b) Simplify $w^5 \times w^7$

.....

(1)

(c) Simplify $(5xy^2)^3$

.....

(2)

(Total for Question 9 is 4 marks)

24. Jan 2019 1HR/Q15a

(a) Simplify $(3x^2y^5)^4$

.....

(2)

25. June 2018 1H/Q3a,b

(a) Simplify $y^5 \times y^9$

.....

(1)

(b) Simplify $(2m^3)^4$

.....

(2)

26. June 2018 1HR/Q14 a, c, d

(a) Simplify $(2e^2 f^3)^3$

.....

(2)

$\frac{\sqrt{a} \times a}{a^{-2}}$ can be written in the form a^k

(c) Find the value of k.

$k =$ .....

(2)

(d) Simplify $\frac{2^n - 1}{4^n - 1}$

.....

(2)

(Total for Question 14 is 8 marks)

MARKING SCHEME

1. June 2025 1H/Q4c

(c)		$125a^{12}r^{6}$	2	B2	for $125a^{12}r^{6}$ (B1 for a product in the form $ka^{p}r^{q}$ where 2 from k, p or q are correct eg $5a^{12}r^{6}$ Allow $125a^{12}$ or $125r^{6}$ or $a^{12}r^{6}$ so as long as not added to any other terms)

2. June 2025 1HR/Q8a,b

8 (a)		a^{16}	1	B1	
(b)		c^{18}	1	B1	

3. Nov 2024 1H/Q3a

3 (a)		p^{15}	1	B1 cao	

4. June 2024 1H/Q10

10 (a)		1	1	B1	
(b)		6	1	B1 Accept y^{6}	
(c)		$125a^{12}c^{6}$	2	B2 for $125a^{12}c^{6}$ B1 for a product in the form $ka^{p}c^{q}$ where 2 from k, p or q are correct eg $5a^{12}c^{6}$ or $125a^{12}3c^{6}$ Accept multiplication signs between terms (Allow $125a^{12}$ or $125c^{6}$ or $a^{12}c^{6}$ as long as not added to any other terms)	
					Total 4 marks

5. June 2024 1HR/Q7a

7 (a)		g^{7}	1	B1	

6. June 2023 1H/Q6a,b

6 (a)		$8c^{12}d^{21}$	2	B2	(B1 for 2 correct terms as part of a product)
(b)		5	1	B1	

7. June 2023 1HR/Q6

6 (a)		m^{7}	1	B1	
(b)		8	1	B1	Allow k^{8}
(c)		$9x^{12}y^{16}$	2	B2	B1 for a product in the form $ax^{p}y^{q}$ where 2 from a , p or q are correct eg $3x^{12}y^{16}$ (Allow $9x^{12}$ or $9y^{16}$ or $x^{12}y^{16}$ so as long as not added to any other terms)
					Total 4 marks

8. Jan 2023 1H/Q12

2	$6-12x$ or $2-4x=\frac{5}{3}-\frac{8}{3}x$		3	M1 for expansion of bracket on the LHS or dividing the RHS by 3 with two terms
	$6-5=12x-8x$ or $1=4x$ or $-12x+8x=5-6$ oe or $-4x=-1$ or $\frac{8}{3}x-4x=\frac{5}{3}-2$ oe or $2-\frac{5}{3}=-\frac{8}{3}x+4x$ oe			M1 ft (dep on 4 terms) for terms in x on one side of equation; number terms on the other
	Working required	$\frac{1}{4}$		A1 oe dep on M1 awarded
				Total 3 marks

9. June 2022 1H/Q9

9	(a)		8	1	B1
	(b)		11	1	B1 accept x^{11}
	(c)		$8k^6m^{12}$	2	B2 for all correct B1 for two correct from 8 or k^6 or m^{12}
					Total 4 marks

10. June 2022 1HR/Q9

9	$-4x \leq 11-3$ **or** $-4x \leq 8$ **or** $-x \leq 2$ **or** $3-11 \leq 4x$ **or** $-8 \leq 4x$		2	M1	allow equals sign or condone incorrect inequality sign for M1 only
		$x \geq -2$		A1	allow $-2 \leq x$ SCB1 for x and -2 with an incorrect sign between them or -2 as an answer
					Total 2 marks

11. Jan 2022 1H/Q1a,b,c

1	(a)		a^{11}	1	B1	
	(b)		w^{12}	1	B1	
	(c)		$64x^{10}y^6$	2	B2	if not B2 then award B1 for 2 correct parts as part of a product eg $kx^{10}y^6$ where $k \neq 64$ **or** $64x^ky^6$ where $k \neq 10$ **or** $64x^{10}y^k$ where $k \neq 6$

12. Jan 2022 1HR/Q9a,b

9	(a)		x^9	1	B1 cao
	(b)		$64y^6$	2	B2 for $64y^6$ (B1 for ky^6 where $k \neq 64$ **or** $64y^m$ where $m \neq 6$)

13. Nov 2021 1H/Q1a

1	(a)		e^6	1	B1 cao

14. May 2021 1H/Q5c

	(c)	$w^2 \times w^n = w^{10}$ **or** $w^5 \times w^n = w^{13}$ **or** $w^5 \times w^{n-3} = w^{10}$ **or** $\frac{w^{5+n}}{w^3} = w^{10}$ oe **or** $5+n-3=10$ **or** $2+n=10$ **or** $5+n=13$		2	M1	A correct first stage simplifying at least one index in a correct equation **or** a clearly correct subsequent stage showing correct use of a rule of indices eg $w^5 \times w^n = w^{30}$ **and** $w^n = w^{30-5}$ **or** a correct equation using indices only
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	8		A1	accept w^8 (trial and error gains full marks if correct and no marks if incorrect unless a rule of indices is clearly shown)

15. Jan 2021 1H/Q9a

9	(a)		$16x^{12}y^{20}$	2	B2	B1 for an answer in the form ax^ny^m with 2 correct from $a = 16$, $n = 12$, $m = 20$

16. Jan 2021 1HR/Q6b

b		1	1	B1

17. Jan 2021 1HR/Q12a

12	a		$4e^5f^3$	2	B2 (B1 for 2 out of 3 terms correct in a 3 term product)

18. Nov 2020 1HR/Q3a

3	(a)		h^9	1	B1

19. Jan 2020 1H/Q7c

	(c)		1	1	B1

20. Jan 2020 1HR/Q3d

	d	$\frac{n^{11}}{n^5}$ **OR** $n^{-1} \times n^7$ **OR** $n^4 \times n^2$ **OR** $n^4 \times n^7 \times n^{-5}$ **OR** $n^{"11"} \div n^5 = n^{("11"-5)}$			M1 for simplifying two terms
			n^6	2	A1

21. June 2019 1H/Q3a,b

3	(a)		e^4	1	B1
	(b)		y^{16}	1	B1

22. June 2019 1H/Q12c

12 contd	(c)	$\frac{y^{\frac{1}{4}}}{y}$ **or** $\sqrt[4]{y} = y^{\frac{1}{4}}$ **or** $y^{\frac{1}{4}-1}$		2	M1 or b = $-\frac{3}{4}$
			$y^{-\frac{3}{4}}$		A1

23. June 2019 1HR/Q9a,b,c

9	(a)		t^6	1	B1
	(b)		w^{12}	1	B1
	(c)		$125x^3y^6$	2	B2 (B1) for 2 correct terms as part of a product
					Total 4 marks

24. Jan 2019 1HR/Q15a

15	(a)		$81x^8y^{20}$	2	B2	(B1 two terms correct in a product of 3 terms)

25. June 2018 1H/Q3a,b

3	a		y^{14}	1	B1
	b		$16m^{12}$	2	B2 if not B2 then B1 for am^{12} **or** $16m^b$ **or** 2^4m^{12} $b \neq 0, 12$ $a \neq 1, 16$

26. June 2018 1HR/Q14 a, c, d

14	(a)		$8e^bf^9$	2	B2 B1 for 2 correct terms in a product of 3 terms
	(b)	$3x^2+9xy-4yx-12y^2$	$3x^2+5xy-12y^2$	2	M1 M1 for 3 correct terms out of 4 **or** for 4 correct terms ignoring signs **or** for $3x^2+5xy+c$ for any non zero value of c **or** for $d+5xy-12y^2$ for any non zero value of d
					A1
	(c)	$a^{\frac{1}{2}} \times a = a^{\frac{3}{2}}$ or $\frac{a}{a^{-2}} = a^3$ or $\frac{a^{\frac{1}{2}}}{a^{-2}} = a^{\frac{5}{2}}$	$\frac{7}{2}$	2	M1 for one correct step
					A1 oe
	(d)	$\frac{2^n-1}{(2^n-1)(2^n+1)}$	$\frac{1}{2^n+1}$	2	M1 for $(2^n-1)(2^n+1)$
					A1
					Total 8 marks