EDEXCEL IGCSE MATHEMATICS

UNIT 1 (MODULAR)

NUMBER – INTEGERS

QP & MS (2018 – 2025)

COMPILED BY:
SIR MUHAMMAD ABDULLAH SHAH

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Integers (LCM, HCF, & Prime Factorisation)

1. June 2025 1HR/Q1

Find the lowest common multiple (LCM) of 45 and 70

.....

(Total for Question 1 is 2 marks)

2. Nov 2024 1H/Q6

$A = 2^3 \times 5^4 \times 7 \times 11$

$B = 2^2 \times 5^2 \times 7^2$

$C = 2^2 \times 5^3 \times 7^4$

Find the highest common factor (HCF) of A, B and C
Write your answer as a product of prime factors.

.....

(Total for Question 6 is 2 marks)

3. June 2024 1HR/Q11a

$A = 2^5 \times 5 \times 7^2$

$B = 2^3 \times 5^3 \times 7^4$

(a) Write down the highest common factor (HCF) of $5A$ and $2B$
Give your answer as a product of prime factors.

.....

(2)

4. Nov 2023 1H/Q7

$A = 5^3 \times 7^3 \times 11^6$ and $B = 5^6 \times 7^2 \times 11^4$

Find the highest common factor (HCF) of A and B
Give your answer as a product of powers of its prime factors.

.....

(Total for Question 7 is 2 marks)

5. June 2023 1H/Q8a, b

(a) Write 300 as a product of its prime factors.
Show your working clearly.

.....

(2)

$A = 2 \times 2 \times 2 \times 3 \times 3 \times 5$

$B = 2 \times 2 \times 3 \times 3 \times 3 \times 5$

(b) Find the lowest common multiple (LCM) of $5A$ and $7B$
Show your working clearly.

.....

(2)

(Total for Question 8 is 4 marks)

6. June 2023 1HR/Q1

Write 2250 as a product of powers of its prime factors.
Show your working clearly.

.....

(Total for Question 1 is 3 marks)

7. June 2022 1H/Q3a, b

(a) Find the highest common factor (HCF) of 56 and 84
Show your working clearly.

.....

(2)

(b) Find the lowest common multiple (LCM) of 60 and 72
Show your working clearly.

.....

(2)

(Total for Question 3 is 4 marks)

8. June 2022 1HR/Q12a, b

$P = 3^3 \times 5^2 \times 7$
$Q = 3^2 \times 5 \times 7^2$

(a) Write down the highest common factor (HCF) of P and Q

.....

(1)

$P = 3^3 \times 5^2 \times 7$
$Q = 3^2 \times 5 \times 7^2$

(b) Work out the value of $P^3 \times Q$
Give your answer in the form $3^x \times 5^y \times 7^z$ where x, y and z are positive integers.

.....

(2)

(Total for Question 12 is 3 marks)

9. Jan 2022 1HR/Q6a, b

(a) Work out the lowest common multiple (LCM) of 36 and 120

.....

(2)

$A = 5^2 \times 7^4 \times 11^p$
$B = 5^m \times 7^{n-5} \times 11$

m, n and p are integers such that
$m > 2$
$n > 10$
$p > 1$

(b) Find the highest common factor (HCF) of A and B
Give your answer as a product of powers of its prime factors.

.....

(2)

(Total for Question 6 is 4 marks)

10. Jan 2021 1HR/Q9a, b

$A = 2^8 \times 3^5 \times 11^4$ $B = 2^6 \times 3 \times 11^8$

(a) Find the highest common factor (HCF) of A and B.

.....

(2)

(b) Find the lowest common multiple (LCM) of $2A$ and $3B$.
Give the LCM as a product of powers of its prime factors.

.....

(2)

(Total for Question 9 is 4 marks)

11. Nov 2020 1H/Q10

$A = 2 \times 3^{43}$
$B = 16 \times 3^{37}$

(a) Find the highest common factor (HCF) of A and B.

.....

(1)

(b) Express the number $A \times B$ as a product of powers of its prime factors.
Give your answer in its simplest form.

.....

(2)

(Total for Question 10 is 3 marks)

12. Jan 2020 1H/Q2

Find the lowest common multiple (LCM) of 28 and 105

.....

(Total for Question 2 is 2 marks)

13.June 2019 1H/Q10

$A = 2^n \times 3 \times 5^m$

Write $8A$ as a product of powers of its prime factors.

.....

(Total for Question 10 is 2 marks)

14. June 2019 1HR/Q5a, b

(a) Write 720 as a product of its prime factors.
Show your working clearly.

.....

(3)

(b) Find the smallest whole number that 720 can be multiplied by to give a square number.

.....

(1)

(Total for Question 5 is 4 marks)

15. Jan 2019 1HR/Q9b, c

(b) Write N as a product of powers of its prime factors.
Show your working clearly.

.....

(3)

(c) Find the largest factor of N that is an odd number.

.....

(1)

16. June 2018 1H/Q8a, b

$A = 3^5 \times 5 \times 7^3$
$B = 2^3 \times 3 \times 7^4$

(a) (i) Find the Highest Common Factor (HCF) of A and B.

.....

(ii) Find the Lowest Common Multiple (LCM) of A and B.

.....

(2)

$A = 3^5 \times 5 \times 7^3$
$B = 2^3 \times 3 \times 7^4$
$C = 2^p \times 5^q \times 7^r$

Given that
the HCF of B and C is $2^3 \times 7$
the LCM of A and C is $2^4 \times 3^5 \times 5^2 \times 7^3$

(b) find the value of p, the value of q and the value of r.

$p =$ .....

$q =$ .....

$r =$ .....

(2)

(Total for Question 8 is 4 marks)

17. June 2018 1HR/Q5

$E = n^2 + n + 5$

Ali thinks that the value of E will be a prime number for any whole number value of n.

Is Ali correct?
You must give a reason for your answer.

.....

.....

(Total for Question 5 is 2 marks)

18. Specimen 1H/Q3a, b

(a) Find the Highest Common Factor (HCF) of 140 and 245

.....

(2)

A machine has a buzzer that sounds every 50 minutes.
The machine also has a bell that sounds every 80 minutes.

The buzzer and the bell sound together at 10 am.

(b) Find the time at which they next sound together.

.....

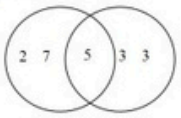
(3)

(Total for Question 3 is 5 marks)

MARKING SCHEME

Integers (LCM, HCF, & Prime Factorisation)

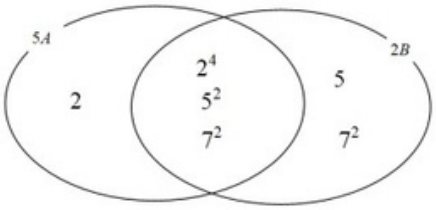
1. June 2025 1HR/Q1

Q	Working	Answer	Mark	Notes
1	45, 90, 135, 180... **and** 70, 140, 210, 280... **or** 2, 5, 7 **and** 3,3,5 **or**  **or** $\frac{45\times70}{5}$ **or** 2, 3, 3, 5, 7 oe **or** 5 | 45 | 70 9 | 14 **or** 5, 9, 14 oe		2	M1 for any correct valid method eg for starting to list at least **four** multiples of each number **or** 2, 5, 7 and 3, 3, 5 seen (may be in a factor tree, ignore 1) **or** a fully correct Venn diagram **or** 5, 9, 14 oe (could be in a table)
	Correct answer scores full marks (unless from obvious incorrect working)	630		A1 Allow $2 \times 3^2 \times 5 \times 7$ oe eg $5 \times 9 \times 14$
				Total 2 marks

2. Nov 2024 1H/Q6

6	B1 for $2^2 \times 5^2$ oe or $2 \times 2 \times 5 \times 5$ oe or $2^2 \times 7$ oe or $2 \times 2 \times 7$ oe or $5^2 \times 7$ oe or $5 \times 5 \times 7$ oe or $2^2 \times 5 \times 7$ oe or $2 \times 2 \times 5 \times 7$ oe or $2 \times 5^2 \times 7$ oe or $2 \times 5 \times 5 \times 7$ oe or $2^2 \times 5^2 \times 7 \times 11$ or $2 \times 2 \times 5 \times 5 \times 7 \times 11$ oe or 700 or $2^p \times 5^q \times 7^r$ where two of p or q or r are correct	$2^2 \times 5^2 \times 7$	2	B2 Allow $2 \times 2 \times 5 \times 5 \times 7$ Answers must be a product of prime factors Can be in any order (allow $2^2 \cdot 5^2 \cdot 7$) Do not allow 1 in the final answer $2 \times 2 \times 5 \times 5 \times 7$ in working space and 700 on answer line award B2 $2^2 \times 5^2 \times 7$ in working space and 700 on answer line award B2 (B1 for $2^p \times 5^q \times 7^r$ where two of p or q or r are correct **or** one mistake in their product (see working on the left for examples) **or** for 700)
				Total 2 marks

3. June 2024 1HR/Q11a

11 (a)	 	$2^4 \times 5^2 \times 7^2$	2	B2 for $2^4 \times 5^2 \times 7^2$ oe eg $2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 7 \times 7$ (B1 for $2^m \times 5^n \times 7^p$ with 2 of $m = 4$, $n = 2$, $p = 2$ **or** for 19 600 without sight of the correct factorisation **or** a fully correct Venn diagram for 5*A* and 2*B* **or** an answer of $2^3 \times 5 \times 7^2$ oe)

4. Nov 2023 1H/Q7

7		$5^3 \times 7^2 \times 11^4$	2	B2 Accept $5^3 \cdot 7^2 \cdot 11^4$ allow 89 676 125 with $5^3 \times 7^2 \times 11^4$ seen If not B2 then award B1 for $5^p \times 7^q \times 11^r$ with two of $p = 3$, $q = 2$ and $r = 4$ (or omission of one with others fully correct) or for 89 676 125 without $5^3 \times 7^2 \times 11^4$ seen or for $5 \times 5 \times 5 \times 7 \times 7 \times 11 \times 11 \times 11 \times 11$ or for an answer of $5^3 + 7^2 + 11^4$ or 5^3, 7^2, 11^4
				Total 2 marks

5. June 2023 1H/Q8a, b

8	(a)	eg $2 \times 2 \times 75$ **or** $3 \times 5 \times 20$ **or** $2 \times 3 \times 50$ **or** $5^2 \times 12$ **or** 2 | 300 2 | 150 | 75		2	M1 for 2 correct stages in prime factorisation with 0 incorrect stages or at least 3 stages in prime factorisation with no more than 1 incorrect stage. Each stage gives 2 factors – may be in a factor tree or a table or listed eg 2, 2, 75 (see LHS for examples of the amount of work needed for the award of this mark). Example of 3 stages with 1 incorrect stage: $300 = 100 \times 30 = 2 \times 50 \times 5 \times 6$
		Working required	$2 \times 2 \times 3 \times 5 \times 5$		A1 dep on M1, oe eg $2^2 \times 3 \times 5^2$
	(b)	$(5A =) 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5$ oe $(= 1800)$ **or** $(5A =) 2^3 \times 3^2 \times 5^2 (= 1800)$ **or** $(7B =) 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7$ oe $(= 3780)$ **or** $(7B =) 2^2 \times 3^3 \times 5 \times 7 (= 3780)$		2	M1 for method to find $5A$ or $7B$ as prime factors (may be seen in factor tree, table or Venn diagram) or as an integer **or** for listing at least 3 multiples of each number eg 1800, 3600, 5400... and 3780, 7560, 11 340... **or** for an answer of 1080 oe eg $2^3 \times 3^3 \times 5$
		Working required	37 800		A1 dep on M1, oe eg $2^3 \times 3^3 \times 5^2 \times 7$
					Total 4 marks

6. June 2023 1HR/Q1

1	e.g. $2 \times 5 \times 225$ or $5 \times 5 \times 90$ or $5^2 \times 90$ $3 \times 5 \times 150$ or $3 \times 3 \times 250$ or $3^2 \times 250$		3	M1	for 2 correct stages in prime factorisation with 0 incorrect stages or at least 3 stages in prime factorisation with no more than 1 incorrect stage. Each stage gives 2 factors – may be in a factor tree or a table or listed eg 2, 2, 225 (see LHS for examples of the amount of work needed for the award of this mark). Example of 3 stages with 1 incorrect stage: $2250 = 225 \times 100 = 3 \times 5 \times 15 \times 100$ or $225 = 3 \times 5 \times 15$
	e.g. 2 | 2250 5 | 1125 | 225 e.g. 2250 → 2, 1125 → 5, 225				
	e.g. $2 \times 3 \times 3 \times 5 \times 5 \times 5$ e.g. 2 | 2250 5 | 1125 3 | 225 5 | 75 3 | 15 5 | 5 | (1) e.g. 2250 → 2, 1125 → 5, 225 → 3, 75 → 5, 15 → 3, 5			M1	for 2, 3, 3, 5, 5, 5 or $2 \times 3 \times 3 \times 5 \times 5 \times 5$ or $2 , 3^2 , 5^3$ oe or $2 + 3^2 + 5^3$ (ignore 1s) (may be a fully correct factor tree or ladder)
	Working required	$2 \times 3^2 \times 5^3$		A1	dep on M2 can be any order (allow $2 . 3^2 . 5^3$)
					Total 3 marks

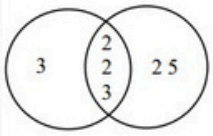
7. June 2022 1H/Q3a, b

3	(a)	1, 2, 4, 7, 8, 14, 28, 56 **and** 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84 **or** 2 2 2 7 **and** 2 2 3 7 **or** e.g. 28 | 56 | 84 | 2 | 3 2 (2, 2, 7) 3		2	M1 for any correct valid method and no errors e.g. for starting to list at least **four** different factors of each number and no errors **or** 2 2 2 7 **and** 2 2 3 7 seen (may be in a factor tree or a ladder diagram and ignore 1) **or** a fully correct Venn diagram **or** other clear method, e.g, table
			28		A1 dep M1 accept $2^2 \times 7$ oe
	(b)	60, 120, 180, 240… **and** 72, 144, 216, 288… **or** 2 2 3 5 **and** 2 2 2 3 3 **or** 2 | 60 | 72 2 | 30 | 36 3 | 15 | 18 2 | 5 | 6 | | 3 5 (2, 2, 3) 2 3 **or** $\frac{60 \times 72}{12}$ **or** 2, 2, 2, 3, 3, 5 oe		2	M1 for any correct valid method and no errors e.g. for starting to list at least **four** multiples of each number **or** 2 2 3 5 **and** 2 2 2 3 3 seen (may be in a factor tree or a ladder diagram and ignore 1) **or** a fully correct Venn diagram **or** other clear method, e.g, table
			360		A1 dep M1 accept $2^3 \times 3^2 \times 5$ oe
					Total 4 marks

8. June 2022 1HR/Q12a, b

12	(a)		$3^2 \times 5 \times 7$	1	B1 accept $3 \times 3 \times 5 \times 7$ oe or 315
	(b)		$3^{11} \times 5^7 \times 7^5$	2	B2 fully correct answer (allow $x = 11, y = 7, z = 5$) (B1 for an answer in the form $3^p \times 5^q \times 7^r$ where one or two of p, q or r are correct)
					Total 3 marks

9. Jan 2022 1HR/Q6a, b

6	(a)	36, 72, 108, ... **and** 120, 240, 360, ... **or** 2, 2, 3, 3 **and** 2, 2, 2, 3, 5 **or**  **or** $\frac{36\times120}{12}$ **or** 2, 2, 2, 3, 3, 5 oe		2	M1 for any correct valid method e.g. for starting to list at least **three** multiples of each number 2, 2, 3, 3 **and** 2, 2, 2, 3, 5 seen (may be in a factor tree or a ladder diagram and ignore 1) (Allow 2 × 2 as 4) **or** a fully correct "Venn" diagram
			360		A1 or $2^3 \times 3^2 \times 5$ oe (allow $2^3 . 3^2 . 5$)
	(b)		$5^2\times7^4\times11$	2	B2 for $5^2\times7^4\times11$ (in any order) (B1 for 660 275 or correct unsimplified product or $5^a\times7^b\times11^c$ where 2 of a, b and c are correct)
					Total 4 marks

2	**36**	**120**
2	18	60
3	9	30
	3	**10**

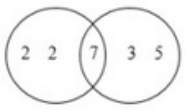
10. Jan 2021 1HR/Q9a, b

9	a		$2^6\times3\times11^4$	2	B2 oe, accept 2 811 072 B1 for $2^a\times3^b\times11^c$ oe where two of a, b and c are correct
	b		$2^9\times3^5\times11^8$	2	B2 cao B1 for $2^a\times3^b\times11^c$ oe where two of a, b and c are correct **or** $2.666...\times10^{13}$ **or** an equivalent expression for e.g. $2^2\times2^7\times3^5\times11^3\times11^5$
					Total 4 marks

11. Nov 2020 1H/Q10

10	(a)		2×3^{37}	1	B1
	(b)	$2\times3^{43}\times2^4\times3^{37}$ **or** $2^5\times3^p$ $(p\neq80)$ **or** $2^q\times3^{80}$ $(q\neq5)$		2	M1
			$2^5\times3^{80}$		A1
					Total 3 marks

12. Jan 2020 1H/Q2

2		28, 56, 84, 112… **and** 105, 210, 315, 420… **or** 2, 2, 7 **and** 3, 5, 7 **or**  **or** $\frac{28\times105}{7}$ **or** 2, 2, 3, 5, 7 oe		2	M1 for any correct valid method e.g. for starting to list at least **four** multiples of each number **or** 2, 2, 7 **and** 3, 5, 7 seen (may be in a factor tree and ignore 1) **or** a fully correct Venn diagram
			420		A1 cao
					Total 2 marks

13. June 2019 1H/Q10

10		(8 =) 2 × 2 × 2 or 2^3 or 2^{3+n}		2	M1	For clearly writing 8 as a product of prime factors or as 2^3
			$2^{n+3} \times 3 \times 5^m$		A1	
						Total 2 marks

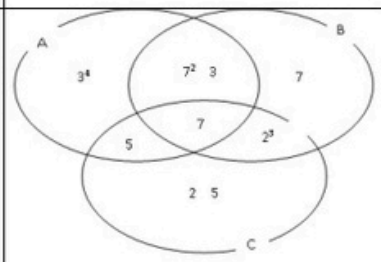
14. June 2019 1HR/Q5a, b

5	(a)	e.g. 720 = 2 × 360 = 2 × 2 × 180 or 720 = 3 × 240 = 3 × 3 × 80 etc		3	M1	At least 2 correct stages in prime factorisation
		2, 2, 2, 2, 3, 3, 5			M1	condone inclusion of 1 (may be a fully correct factor tree or ladder)
			2 × 2 × 2 × 2 × 3 × 3 × 5		A1	dep on M2, accept $2^4 \times 3^2 \times 5$
	(b)		5	1	B1	
						Total 4 marks

15. Jan 2019 1HR/Q9b, c

(b)		$2^{14} \times 3 \times 5^{10}$	3	B3	for the correct answer
				B2	for an answer in the form $2^m \times 3 \times 5^n$, where m and n are positive integers
				B1	for at least 2 correct steps in repeated prime factorisation (including tree diagram)
(c)		29 296 875	1	B1	Accept 3×5^{10}, 2.9296875×10^7

16. June 2018 1H/Q8a, b

Question	Working	Answer	Mark	Notes
8 a (i)		3×7^3	1	B1 for 3×7^3 oe **or** 1029
(ii)		$2^3 \times 3^5 \times 5 \times 7^4$	1	B1 for $2^3 \times 3^5 \times 5 \times 7^4$ oe **or** 23 337 720
b		4, 2, 1	2	M1 for $r = 1$ **or** for $p = 4$ **and** $q = 2$ **or** correct representation of C in terms of prime factors on a Venn diagram A1

17. June 2018 1HR/Q5

5	For example, n | E 1 | 7 2 | 11 3 | 17 4 | 25 5 | 35	No + reason	2	M1	for evaluating E correctly for any value of n
				A1	for No with E evaluated correctly as a non-prime number
					Total 2 marks

18. Specimen 1H/Q3a, b

3	a	$140 = 2 \times 2 \times 5 \times 7$; $245 = 5 \times 7 \times 7$			M1	or lists at least 3 factors of each number (other than 1 and the number) (1, 2, 4, 10, 14, 35, 70, 140) (1, 5, 7, 35, 49, 245)
			35	2	A1	
	b	50, 100, 150, 200, 250, 300, 350, 400 **and** 80, 160, 240, 320, 400 **OR** $2 \times 5 \times 5$ **and** $2 \times 2 \times 2 \times 2 \times 5$			M1	
		$2 \times 2 \times 2 \times 2 \times 5 \times 5$ **or** 400			M1	LCM found
			16 40	3	A1	or 4 40 pm
						Total 5 marks