Name: _____

IGCSE (9-1) Maths
topics new to Foundation tier:
LCM and HCF

Date:

Time: 30 minutes

Total marks available: 23

Total marks achieved: _____

Q1. Find the Lowest Common Multiple (LCM) of 20 and 24

(Total 2 marks)

Q2.

(*a*) Find the Highest Common factor (HCF) of 75 and 90

(2)

(*b*) Find the Lowest Common Multiple (LCM) of 75 and 90

(2)

(Total 4 marks)

Q3.

$3780 = 2^2 \times 3^3 \times 5 \times 7$	$3240 = 2^3 \times 3^4 \times 5$

(*a*) Find the highest common factor (HCF) of 3780 and 3240
Give your answer as a product of prime factors.

(2)

(*b*) Find the lowest common multiple (LCM) of 3780 and 3240
Give your answer as a product of prime factors.

(2)

(Total 4 marks)

Q4. $A = 2^3 \times 3^2 \times 5^4$
$B = 3^5 \times 5 \times 7^3$

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

(Total 2 marks)

Q5. Given that $A = 2^3 \times 3$ and $B = 2^2 \times 3^2$

find the Lowest Common Multiple (LCM) of *A* and *B*.

(Total 2 marks)

Q6. $A = 2^2 \times 3 \times 5^2$
$B = 2^3 \times 5$

(i) Find the Highest Common Factor (HCF) of *A* and *B*.
(ii) Find the Lowest Common Multiple (LCM) of *A* and *B*.

(Total 3 marks)

Q7. $m = 3^4 \times 5^3$
$n = 3^3 \times 5^2 \times 11$

Find the Lowest Common Multiple (LCM) of m and n.

(Total 2 marks)

Q8. x is an integer.

The Lowest Common Multiple (LCM) of x and 12 is 120
The Highest Common Factor (HCF) of x and 12 is 4

Work out the value of x.

(Total 2 marks)

Q9. The highest common factor (HCF) of 140 and x is 20
The lowest common multiple (LCM) of 140 and x is 420

Find the value of x.

(Total 2 marks)

Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
	$20 = 2^2 \times 5$ and $24 = 2^3 \times 3$ or $2^3 \times 3 \times 5$ or 20,40,60,80,100,120 and 24,48,72,96,120		2	M1
		120		A1 or $2^3 \times 3 \times 5$ oe
				Total 2 marks

Q2.

Question	Working	Answer	Mark	Notes
(a)	$75 = 3 \times 5^2$ and $90 = 2 \times 3^2 \times 5$ or 1,3,5,15,25,75 and 1,2,3,5,6,9,10,15,18,30,45,90 or 3×5		2	M1 Need not be products of powers; accept products or lists ie 3,5,5 and 2,3,3,5 Prime factors may be shown as factor trees or repeated division
		15		A1
(b)	$2 \times 3^2 \times 5^2$ oe eg $6 \times 3 \times 5^2$ or 75,150,225,300,375,450 and 90,180,270,360,450		2	M1 Also award for $\frac{75 \times 90}{15}$
		450		A1
				Total 4 marks

Q3.

Question	Answer	Mark	Notes
(a)		2	M1 For identifying 2^2, 3^3, and 5 or any product of integer powers of 2 and 3 and 5 where at least two powers are correct and the third is greater than 0 or 540
	$2\times2\times3\times3\times3\times5$		A1 Accept $2^2\times3^3\times5$
(b)		2	M1 For identifying 2^3, 3^4, 5 and 7 or any product of integer powers of 2 and 3 and 5 and 7, where at least three powers are correct and the fourth is greater than 0. Accept a product that includes 2,3 and 5 and 7 and multiplies to 22680 (Eg $2^3\times3^2\times5\times7\times9$) or 22680
	$2\times2\times2\times3\times3\times3\times3\times5\times7$		A1 Accept $2^3\times3^4\times5\times7$
			Total 4 marks

Q4.

Question Number	Working	Answer	Mark	Notes
	Product of positive integer powers of both 3 and 5 only		2	M1 Powers and/or products may be evaluated eg 15
		$3^2\times5$ or 45		A1 Also accept 9×5
				Total 2 marks

Q5.

Q	Working	Answer	Mark	Notes
	$2^3\times3^2$		2	M1 for identifying 2^3 **or** 3^2 **or** for 24, 48, 72 **and** 36, 72 **or** for an answer of 144 **or** 216
		72		A1 accept $2^3\times3^2$
				Total 2 marks

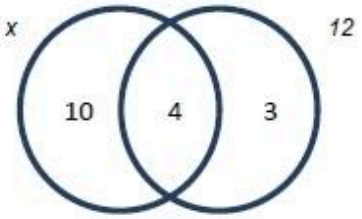
Q6. [not part (b)]

Question	Working	Answer	Mark	Notes
(a) (i)		$2^2 \times 5$	3	B1 for $2^2 \times 5$ oe or 20
		$2^3 \times 3 \times 5^2$		B2 for $2^3 \times 3 \times 5^2$ oe or 600
(ii)				(B1 for any product using powers of 2 and 3 and 5 **or** at least 300, 600… **and** 40, 80, 120 …)
(b)	8 (= 2^n) **or** 2^3		2	M1 for one correct use of index laws eg. $8^5 \div 8^4$
		3		A1
				Total 5 marks

Q7. [part a only]

Question	Working	Answer	Mark	Notes
(a)		111375	2	M1 For $3^a \times 5^b \times 11$ with $a = 4$ or $b = 3$
				A1 Accept $3^4 \times 5^3 \times 11$ oe
(b)		2025	2	M1 For $3^4 \times 5^q$ or $3^p \times 5^2$ (and no 11) or $n \times 3^3 \times 5^2$ where $n \neq 11$
				A1 Accept $3^4 \times 5^2$ oe
				Total 4 marks

Q8.

Question	Working	Answer	Marks	Comments
	(12 =) 2 × 2 × 3 or (120 =) 2 × 2 × 2 × 3 × 5 (condone 2,2,3 or 2,2,2,3,5) [factors could be seen at the end of a 'factor tree' or in a 'factor ladder'] **or** Venn diagram with the middle and one other region correct:  Where 10 may be 2,5 and 4 may be 2,2	40	2	M1 **or** for a list of at least 5 consecutive multiples of 4 **or** a list of at least 5 factors of 120 **or** for $12x = 120 \times 4$ oe (eg $\frac{120}{12} \times 4 (= x)$) **or** $12 \div 4 (= 3)$ and $120 \div$ "3" A1 accept $2 \times 2 \times 2 \times 5$ **or** $2^3 \times 5$
				Total 2 marks

Q9.

Q	Working	Answer	Mark	Notes
	20 = 2, 2, 5 140 = 2, 2, 5, 7 420 = 2, 2, 3, 5, 7	60	2	M1 For identifying the prime factors for 2 of the 3 numbers 20,140,420 (can be implied by a factor tree, repeated division or Venn diagram) or For a complete Venn diagram for x and 140 with 20 in the intersection or $x = 20 \times 3$ or $20 \times 7 \times y = 420$ or $\frac{420}{20 \times 7}$ or At least the 1st 3 multiples of 20 or $140x = 420 \times 20$ oe Allow 2×2×3×5 A1
				Total 2 marks