



GCSE Foundation 02

Number



103 minutes



100 marks

Powers and roots

M1. (a) 21 and 35

*B1 for 1 correct (and 1 incorrect)
or 2 correct and 1 incorrect*

B2

(b) 6 and 10

*B1 for 1 correct (and 1 incorrect)
or 2 correct and 1 incorrect*

B2

(c) 16 and 25

*B1 for 1 correct (and 1 incorrect)
or 2 correct and 1 incorrect*

B2

[6]

M2. (a) 7.5

Not equivalent to $\frac{3}{4}$

or 0.75 or 75%
oe or other valid reason

B1

(b) $\frac{4}{10}$ and

Not equivalent to $\frac{1}{3}$
oe or other valid reason

B1

(c) $\sqrt{125}$

Not an exact square root
oe or other valid reason

B1

(d) 15

Not a prime number or other valid reason
*eg only multiple of 3
or only multiple of 5*

B1

[4]

M3.	(a) 10^5	B1	[4]
	(b) 20 <i>B2 for 8 and 25 seen</i> <i>B1 for 8 or 25 seen</i>	B3	
M4.	(a) Accept any two whole numbers ending in a 0 or 5 <i>eg 0, 5, 10, 15, 20</i>	B1	[4]
	(b) Any two of 1, 2, 3, 6, 9 or 18	B1	
	(c) Any two of 16, 25, 36 or 49 <i>B1 for 1 correct and 1 incorrect.</i> <i>B1 for any two of 4², 5², 6², 7²</i> <i>B1 for any two other square numbers</i>	B2	
M5.	(a) 1200	B1	[3]
	(b) 120 000	B1	
	(c) 10^6	B1	
M6.	(B =) 32	B1	[4]
	(C =) their $32 \div 2$ or 16 seen	M1	
	(D =) their $32 - 11$ or 21 seen	M1	
	(E =) 11 <i>100 – (20 + their B + their C + their D)</i> <i>ft dependent on both Ms</i>	A1 ft	

M7. (a) 11 or -11 or both

B1

(b) $45 \div 5 \times 3$ or $45 \times 3 \div 5$

oe eg $\frac{60}{100} \times 45$

M1

27

A1

(c) $\frac{8}{100} \times 150$ or 8×1.5

or $8 \div 2 \times 3$

oe eg $10\% = 15$ ($1\% = 1.5$)

$2\% = 3$ so $8\% = 15 - 3$ or $8\% = 4 \times 3$

M1

12

oe eg 12.0 or 12.00

A1

[5]

M8. (a) (i) Multiple of 6 > 20

eg 24, 30, 36, ...

B1

(ii) 1 or 2 or 4 or 5

B1

(b) Square root
Square
Cube root

B1 for each correct answer

B3

(c) 52

B1

[6]

M9.	(a) (i) 70	B1	
	(ii) 5	B1	
	(iii) 25	B1	
	(iv) 75	B1	
	(b) 150		
	<i>oe B1 for $\frac{70}{35}$ or 2 seen</i>	B2	[6]

M10.	(a) 5 (x) 4 <i>At least one correct</i>	M1	
	20	A1	
	(b) (i) 81	B1	
	(ii) Always even ticked and a valid example eg, $9^2 + 3^2 = 90$ <i>B1 if example incomplete eg, $9^2 + 3^2$</i>	B2	[5]

M11.	(a) 7^8	B1	
	(b) 1 <i>Not 1^8</i>	B1	[2]

M12.	(a) 36 <i>B1 For any 3 correct outputs seen eg, 8, 15, 22 B1 For any other correct square number eg, 64</i>	B2	
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(b) 29

*B1 For any other correct prime number
eg, 43, 71*

B2

[4]

M13. $\sqrt{9100} = 95.3(\dots)$ or 95.4
 $95^2 = 9025$

B1

$\sqrt{9200} = 95.9(\dots)$
 $96^2 = 9216$

B1

No whole numbers between 95.4 and 95.9 oe
 $95^2 < 9100$ and $96^2 > 9200$ oe

E1

[3]

M14. (a) 121

B1

(b) 144

B1

(c) 5

B1

[3]

M15. Fact 1 ✓
Fact 2 ✗
Fact 3 ✗
Fact 4 ✗
Fact 5 ✓

*B2 3 or 4 correct
B1 1 or 2 correct*

B3

[3]

- M16.** (a) 9, 49, 81
B1 For one or two correct **B2**
- (b) Nathan True **B1**
- Tessa False **B1**
- Kim True **B1**
- (c) 7743 **B1**
- [6]**

- M17.** (a) 4, 6, 8 and 12 or 3, 6, 9 and 12
Any order **B1**
- (b) 6 or 12 or 18 **B1**
- (c) 3, 6, 9 and 18
*B1 2 correct with 0 incorrect
or 3 correct with 0, 1 or 2 incorrect
or 4 correct with 1 or 2 incorrect* **B2**
- (d) $9 - 4$ **M1**
- $(\pm) 5$ **A1**
- [6]**

M18.	(a) Evidence of 2 square numbers other than one	M1	
	25 and 16 or 25 and 9	A1	
	(b) Evidence of summing any three consecutive square numbers or 77 seen	M1	
	36, 25 and 16	A1	[4]
M19.	$(\sqrt{25} =) 5$	B1	
	$(\sqrt{16} + \sqrt{9} =) 7$	B1	[2]
M20.	(a) 1, 2, 3, 4, 6, 9, 12, 18, 36 seen oe eg, $1 \times 36, 2 \times 18, 4 \times 9, 3 \times 12, 6 \times 6$ seen Allow up to 2 errors or omissions	M1	
	12 and 18	A1	
	(b) $1 + 2$ and 1×2 or $1 + 8$ and 1×8 or $3 + 6$ and 3×6 or ft Their 2-digit factors	M1	
	18 SC1 any value that satisfies both conditions eg, 88	A1	[4]

M21. (a) 0.308, 0.35, 0.4

B1

(b) 15.29

B1

(c) (i) 0.08

$$\frac{2}{25}$$

B1

(c) (ii) 12.5

B1

(d) Square any number between 0 and 1 inclusive and show it
Square any number greater than 1 and show it B1
(number in correct range)² but not evaluated
or evaluated incorrectly B1

[5]

M22. 28

B1 36 and 64 identified

B2

[2]

M23. (a) 28

B1

(b) 6 and 8

– 1 eeo

B2

(c) 25

B1

(d) 11

B1

[5]

