DOT EDUCATION
(KHDA APPROVED)

NUMBERS MARKING SCHEME FOUNDATION

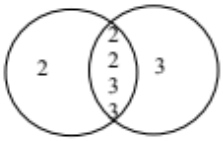
1.

(a)		Saimaa	1	B1 Accept 13 600
(b)		Six thousand one hundred and twenty four	1	B1
(c)		6189	1	B1 cao
(d)		60	1	B1 or 6 tens or sixty
(e)		3808 & 4361	1	B1 accept Kentucky and Superior
				Total 5 marks

2.

(a)(i)		9	1	B1 cao
(ii)		24	1	B1 cao
(iii)		8	1	B1 cao
(iv)		2	1	B1 cao
(b)		76	1	B1 cao
				Total 5 marks

3.

	1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72 **and** 1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 108 **or** 2 2 2 3 3 **and** 2 2 3 3 3 **or**  12 | 72 | 108 3 | 6 | 9 2 | 3		2	M1 for any correct valid method and no errors eg for starting to list at least **four** different factors of each number and no errors **or** 2 2 2 3 3 **and** 2 2 3 3 3 seen or 4 2 3 3 **and** 4 3 3 3 seen or 2 2 2 9 **and** 2 2 3 9 seen or 4 2 9 **and** 4 3 9 seen or 2 36 **and** 3 36 etc (may be in a factor tree or a ladder diagram with no errors and ignore 1) **or** a fully correct Venn diagram **or** other clear method, eg table
	Working required	36		A1 dep on M1 Accept $2^2 \times 3^2$ oe
				Total 2 marks

4.

(a)		15 or 19	1	B1	or for both values and no other values
(b)		48	1	B1	cao
(c)		19	1	B1	cao
(d)		6	1	B1	cao
					Total 4 marks

5.

(a)		267	1	B1	cao
(b)		2744	1	B1	cao
(c)	eg selecting 987 and 139 **or** for 987 – n where n is a number from the list **or** m – 139 where m is a number from the list **or** for 987, 973, 393, 151, 139 **or** for 139, 151, 393, 973, 987		2	M1	for identifying 987 and 139, could be shown or circled **or** for 987 – n where n is a number from the list **or** m – 139 where m is a number from the list **or** for writing the numbers in order of size
	Correct answer scores full marks (unless from obvious incorrect working)	848		A1	cao
					Total 4 marks

6.

			2	M1	for 18.4(867…) **or** 2.65(88) **or** 6.95 **or** 6.953 **or** 6.9530
	Correct answer scores full marks (unless from obvious incorrect working)	6.95304(3483...)		A1	
					Total 2 marks

7.

(a)		–89, –77, –6, 39, 43	1	B1	
(b)		0.017, 0.12, 0.134, 0.145, 0.3	1	B1	Allow extra zeros eg 0.017, 0120, 0.134, 0.145, 0.300

8.

	1.63(17…) or 1.43(17…) or $\frac{5258}{27425}$ or 0.19, 0.191, 0.192, 0.1917		2	M1	A start to the calculation or an answer given as a fraction or a prematurely rounded answer
	Correct answer scores full marks (unless from obvious incorrect working)	0.19172(28806)		A1	at least 5 dp
					Total 2 marks

9.

(a)		5, 39, 71, 122, 150	1	B1	
(b)		0.074, 0.13, 0.37, 0.7, 3.77	1	B1	
(c)		5084	1	B1	
(d)		3 hundreds	1	B1	accept 300, hundreds
					Total 4 marks

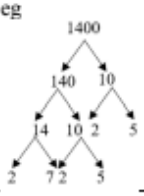
10.

(a)		57.6	1	B1	
(b)		Arrow pointing at 240	1	B1	
(c)		0.79	1	B1	
					Total 3 marks

11.

(a)		11.56	1	B1	oe eg $\frac{289}{25}$ or $11\frac{14}{25}$
(b)		72	1	B1	
(c)		7^4	1	B1	
(d)(i)		$(5 + 3) \times 2 = 16$	1	B1	
(ii)		$10 - 8 - (10 - 6) \div 2 = 0$	1	B1	
					Total 5 marks

12.

	eg $2 \times 2 \times 350$ **or** $2 \times 7 \times 100$ **or** $2 \times 5 \times 140$ **or** $5 \times 7 \times 40$ **or** $5 \times 5 \times 56$ **or** $(14 \times 100 =) 2 \times 7 \times 100$ **or** $(28 \times 50 = 4 \times 7 \times 50 =) 2 \times 2 \times 7 \times 50 =$ **or** 2 | 1400 2 | 700 | 350		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, 350 (see LHS for examples of the amount of work needed for the award of this mark). Example of 3 stages with 1 incorrect stage: $1400 = 10 \times 14 = 2 \times 5 \times 2 \times 7$
	eg 2, 2, 2, 5, 5, 7 eg 2 | 1400 2 | 700 5 | 350 2 | 70 5 | 35 | 7 eg  			M1	dep on M1 for $2 \times 2 \times 2 \times 5 \times 5 \times 7$ or $2^3, 5^2, 7$ or $2^3 + 5^2 + 7$ (Ignore 1's) (may be seen in a fully correct factor tree or ladder)
		$2^3 \times 5^2 \times 7$		A1	dep on M2 (do not allow 1 in the final answer) Can be in any order (allow $2^3 . 5^2 . 7$) but must be in index form as asked for.
	Working required				**Total 3 marks**

13.

(a)	0.725(806...) or 1.53(9419...) **or** 14.8(4) **or** 2.26 **or** 2.27 **or** 2.265		2	M1	
	Correct answer scores full marks (unless from obvious incorrect working)	2.2652(25539...)		A1	
(b)		2.27	1	B1	ft from (a) dep on a number that has 4 or more significant figures
					Total 3 marks

14.

(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, 11340... **or** for an answer of 1080 oe eg $2^3 \times 3^3 \times 5$
	Working required	37800		A1	dep on M1, oe eg $2^3 \times 3^3 \times 5^2 \times 7$
					Total 4 marks

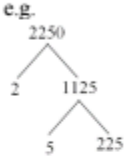
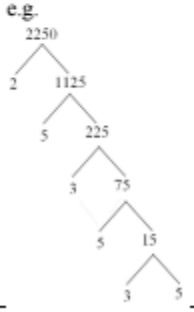
15.

(a)		Tuesday	1	B1	accept Tues, Tue, Tu Allow 11 362
(b)		Nine thousand six hundred and fifty three	1	B1	
(c)		8930	1	B1	cao
(d)		9 hundreds	1	B1	accept 100(s), hundred(s), 900, nine hundred(s)
(e)		17391	1	B1	cao
					Total 5 marks

16.

(a)		97	1	B1	
(b)		43	1	B1	
(c)	16 **or** 125		2	M1	for sight of 16 **or** 125
	Correct answer scores full marks (unless from obvious incorrect working)	2000		A1	
					Total 4 marks

17.

	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 $3^2 \times 250$ e.g. 2 | 2250 5 | 1125 | 225 e.g.  		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. $2 \times 3 \times 3 \times 5 \times 5 \times 5$ e.g. 2 | 2250 5 | 1125 3 | 225 5 | 75 3 | 15 5 | 5 | (1) e.g.  			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

18.

(a)		7054	1	B1	
(b)		78 300	1	B1	
(c)		70 000	1	B1	or seventy thousand oe or tens of thousands or 10 000 (the place value of the 7)
(d)		2000	1	B1	2,000 accept 2000 seen elsewhere if box is empty
(e)		10 000	1	B1	10^4
					Total 5 marks

19.

(a)		60	1	B1	
(b)		9	1	B1	
(c)		21	1	B1	Sometimes continental 1 looks like 7…please accept as no 27 on list
(d)		15	1	B1	
					Total 4 marks

20.

(a)		Valid Reason	1	B1	eg Finn added 5 and 3, but he should have squared the 3 first.
(b)		$2 \times 6 - (4^2 - 14)$	1	B1	Brackets in correct location. Condone correct but unnecessary brackets. [must not be around the minus sign between the 6 and the 4^2]
(c)	9 + ... **or** .....+ 10 **or** $(-3)^2 + 5 \times 2$ **or** $-3 \times -3 + 5 \times 2$		2	M1	For either 9 or 10 in the correct place or the correct substitutions (brackets around –3 squared, unless recovered)
	Correct answer scores full marks (unless from obvious incorrect working)	19		A1	
					Total 4 marks

21.

(a)(i)		20	1	B1 cao
(ii)		25	1	B1 cao
(b)(i)		cube	1	B1 ignore misspelling
(ii)		factor	1	B1 ignore misspelling
				Total 4 marks

22.

(a)(i)		40	1	B1 cao
(ii)		27	1	B1 allow 3^3
(b)		–9	1	B1 cao
(c)		21	1	B1 cao
(d)		2 + odd prime number	1	B1 eg. 2 + 3, 2 + 5 etc
				Total 5 marks

23.

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

24.

(a)		Twenty eight thousand one hundred (and) forty nine	1	B1	All must be in words – accept incorrect spelling if meaning is clear. Sometimes 'and' may be included in places it is not included here – please allow this. Allow words such as 'fourty' or 'thorty' or 'fourlity' for forty and similar words for other numbers
(b)		Kenya	1	B1	accept incorrect spelling if meaning is clear. Allow K or k or other shortened form of Kenya
(c)		80	1	B1	Eighty or tens or 8 tens or 8 ×10s or similar. (Not 8 tenths) accept incorrect spelling if meaning is clear.
(d)		16 000	1	B1	accept '16 thousand' or 'sixteen thousand'
					Total 4 marks

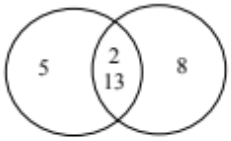
25.

			2	M1	For 35.74 or 3.80788…. or for the correct answer but rounded or truncated to 3, 4 or 5 significant figures (9.38, 9.39, 9.385, 9.386, 9.3857, 9.3858)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	9.38578(…)		A1	Minimum 9.38578
					Total 2 marks

26.

(a)		Hamlet	1	B1
(b)		Henry V and Julius Caesar	1	B1
(c)		26 450	1	B1
(d)		Twenty one thousand and fifty five	1	B1
				Total 4 marks

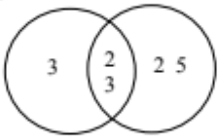
27.

(b)	2, 5, 10, 13, 26, 65 **and** 2, 4, 8, 16, 26, 52, 104 **or** 2, 5, 13 **and** 2, 2, 2, 2, 13 oe  or e.g. **26** | 130 | 208 | **5** | **8** e.g. **2** | 130 | 208 **13** | 65 | 104 | **5** | **8**		2	M1 for starting to list at least **two** factors of each number excluding 1 and *n* (Two factors may be written as, for e.g, 130 ÷ 26 = 5 and 208 ÷ 26 = 8 oe or 130 ÷ 13 = 10 and 208 ÷ 13 = 16 etc) **or** 2, 5, 13 **and** 2, 2, 2, 2, 13 seen (may be in a factor tree or a ladder diagram and ignore 1) **or** a fully correct Venn diagram oe **or** other clear method, e.g, table
	Working required	26		A1dep on M1
				Total 4 marks

28.

(a)		15	1	B1
(b)		18	1	B1
(c)		16	1	B1
(d)		2	1	B1
(e)		8 and 18	1	B1
				Total 5 marks

29.

(a)		1, 2, 5, 10	1	B1	in any order
(b)	18, 36, … **and** 60, 120, … **or** 2 3 3 oe **or** 2 2 3 5 oe **or**  **or** **2** | 18 | 60 **3** | 9 | 30 **5** | **3** | 10 | | **2** **or** 2, 2, 3, 3, 5 oe		2	M1	for any correct valid method and no errors e.g. for starting to list at least **two** multiples of each number **or** 2 3 3 seen **or** 2 2 3 5 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, not be written as a product
	Working required	180		A1	accept $2^2 \times 3^2 \times 5$ oe
					Total 3 marks

30.

(a)	0.48031(4...) + 0.45555(5...) **or** $\frac{61}{127} + \frac{41}{90}$		2	M1	Evaluate either fraction correctly as a decimal to at least 5 sf (rounded or truncated) or as a simplified fraction or an answer of 0.935, 0.936, 0.9358 or 0.9359
	Correct answer scores full marks (unless from obvious incorrect working)	0.93587(05162)		A1	Correct to at least 5 sf (rounded or truncated)
(b)		0.936	1	B1	ft if at least 4 sf given in (a)
					Total 3 marks

31.

(a)		3567	1	B1	
(b)		7536	1	B1	
(c)		37 or 53 or 73 or 67	1	B1	
(d)		56	1	B1	
					Total 4 marks

32.

(a)		554 correctly indicated	1	B1	Arrow or other mark shown clearly at 554 (2nd notch to right of 550)
(b)		3250	1	B1	
					Total 2 marks

33.

(a)		169	1	B1	
(b)		3	1	B1	
(c)		1.45582(0007)	2	B2	(B1 for 5.590… or 3.84 or 1.45, 1.46, 1.455, 1.456, 1.4558)
					Total 4 marks

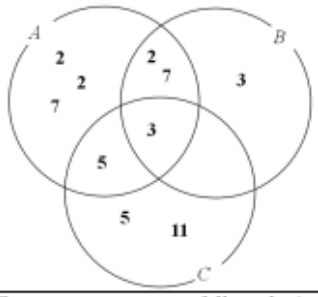
34.

(a)		2.745	1	B1	
(b)		2.755	1	B1	
(c)	$(80 \times 60) \div 2^2$		2	M1	For two of 80, 60, 2 or 4 rather than 2^2 oe
	eg $(80 \times 60) \div 2^2 = 1200$ *working with rounded values seen required*	1200		A1	dep on M1 for answer coming from the use of the 3 rounded numbers – if 1200 seen then ignore any other working and comments
					Total 4 marks

35.

(a)		84, 105, 171, 233, 490	1	B1	
(b)		5102	1	B1	
(c)		3 tens	1	B1	accept 30, tens
(d)		700	1	B1	
					Total 4 marks

36.

(a)	$2\times2\times2\times5\times5$ **or** 2, 2, 2, 5, 5 **or** $2\times2\times3\times5\times7$ **or** 2, 2, 3, 5, 7 **or** eg 2 | **200** | **420** 2 | 100 | 210 5 | 50 | 105 | 10 | 21		2	M1	for one number written as a product of prime factors or prime factors listed – numbers may be at end of factor trees or on 'ladder diagrams' or in a table or in a Venn diagram **or** at least two factors for each (excluding 1, 200, 420)
	Correct answer scores full marks (unless from obvious incorrect working)	20		A1	or $2^2\times5$ oe
(b)			2	M1	for $2^m\times3^n\times5^p\times7^q\times11^r$ with at least three of $m=3$, $n=2$, $p=2$, $q=2$, $r=1$ (all 5 terms should be seen) **or** omission of one term with others fully correct **OR** prime factors seen in a Venn diagram – if so must be fully correct
	Correct answer scores full marks (unless from obvious incorrect working)	$2^3\times3^2\times5^2\times7^2\times11$		A1	allow 970 200 oe
					Total 4 marks