1. 36 is a square number.

   Find two factors of 36, other than 36 itself, which are also square numbers.

   _ _ _ _ _ _ _ _ _ _ _ _ _ and _ _ _ _ _ _ _ _ _ _ _ _ _ [2]

2. Vivek has £10 079 in his bank account.

   Write 10 079 in words.

   _____

   _____[1]

3(a). Here are six numbers.

| 5 | 8 | 9 | 15 | 22 | 54 |

   From these numbers, find a number that is

   a multiple of two and a multiple of three,

   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ [1]

(b). a factor of 30 and a factor of 40.

_____ [2]

4. Find **three different** numbers that are each

- a prime number
- two less than a square number.

_____ [3]

5(a). Write down **all** the factors of 18.

_____

[2]

(b). Write down **two** multiples of 7.

_____

[1]

(c). Write down a prime number between 6 and 15.

_____

[1]

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6(a). Choose from this list

| 17 | 18 | 25 | 28 | 39 | 72 |

a multiple of 7,

_____

[1]

(b). a factor of 36,

_____

[1]

(c). a prime number.

_____

[1]

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7(a). Here are the integers from 25 to 30.

$$25 \qquad 26 \qquad 27 \qquad 28 \qquad 29 \qquad 30$$

  (i) Which of these numbers is divisible by 7?

(i) _____ **[1]**

 (ii) Which of these numbers has 13 as a factor?

(ii) _____ **[1]**

(iii) Which of these numbers is prime?

(iii) _____**[1]**

(b). Write down a multiple of 25 which is between 120 and 140.

_____ **[1]**
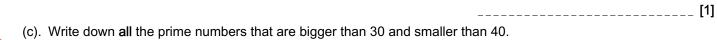
8(a). From the numbers 30 to 39, choose

a multiple of 5,

_____ [1]

(b). a square number,

_____ [1]

(c). a prime number.

_____ [1]

9. Write down two factors of 10.

_____ , _____ [1]

10(a) Here is a list of numbers.

.

| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |

From this list, write down a number that is

(i) a multiple of 8,

(i) _ **[1]**

(ii) a square,

(ii) _ **[1]**

(iii) a cube,

(iii) _ **[1]**

(iv) prime.

(iv) _ **[1]**

(b). Which two numbers in the list have a common factor of 7?

_ _ _ _ _ _ _ _ _ _ _ _ and _ _ _ _ _ _ _ _ _ _ _ _ **[1]**

11(a) Write down **all** the multiples of 2 that are bigger than 30 and smaller than 40.

.

_ **[1]**

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(b). Write down the multiple of 7 that is bigger than 30 and smaller than 40.

_____ [1]

(c). Write down **all** the prime numbers that are bigger than 30 and smaller than 40.

_____ [2]

12. Written as the product of its prime factors, $108 = 2^2 \times 3^3$.

   (i) Write 96 as the product of its prime factors.

   (i) _____ [2]

   (ii) Find the highest common factor of 96 and 108.

   (ii) _____ [2]

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13(a) Here is a list of numbers.

.

| 11 | 27 | 81 | 21 | 41 | 42 | 23 | 39 | 45 |

From this list, write down

the even number.

_____ [1]

(b). the square number.

_____ [1]

(c). all the prime number. all the prime numbers.

_____ [2]

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14.

Write 490 as the product of its prime factors.

_____ [2]

15. Two numbers have these properties.

- Both numbers are greater than 6.
- Their highest common factor (HCF) is 6.
- Their lowest common multiple (LCM) is 60.

Find the two numbers.

_____ and _____ [3]

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END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Part marks and guidance	
1			Two of 1, 4, 9	2	**B1** for at least one correct and no more than one wrong number stated **Examiner's Comments** There were significantly fewer correct responses. Those that were correct invariably used 4 and 9, and 1 was very rare. Candidates often gave factors of 36 that were not square numbers, with 6 being a common error.	Allow 2 for all of 1, 4, 9
			Total	**2**		
2			Ten thousand [and] seventy[–]nine [pounds / pence]	1	**Examiner's Comments** Was usually correct with encouragingly few spelling errors.	Condone intent for spelling if meaning clear
			Total	**1**		
3	a		54	1		
	b		5	2	**M1** for a complete factor tree **oe**	
			Total	**3**		
4			Any three valid answers e.g. 2, 7, 23	3	**B1** for each If zero scored **SC1** for at least 3 primes and 3 squares **seen**	
			Total	**3**		

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Question			Answer/Indicative content	Marks	Part marks and guidance	
5	a		1 2 3 6 9 and 18	2	M1 At least 4 correct and at most 1 incorrect in answer	**Examiner's Comments** Most candidates scored 1 mark for having four or more factors with few marks lost for incorrect factors - the most common omissions were 1 and 18. Candidates clearly understood the question with very few giving multiples instead of factors although a small number used the product of prime factors.
	b		Any 2 multiples of 7	1		Ignore extra if correct **Examiner's Comments** The large majority scored the mark, often with 14 and 21, but a significant number thought that 1 was a multiple of 7.
	c		7 11 or 13	1		**Examiner's Comments** Well answered and one of the three correct prime numbers was usually given – the most common error being 9. Some gave all three numbers (7, 11, 13) but candidates need to be aware that if more than one answer is given then all alternatives have to be correct. Few gave prime numbers outside the specified range.
			Total	4		

Question			Answer/Indicative content	Marks	Part marks and guidance	
6	a		28	1	**Examiner's Comments** This question was well answered with the majority of candidates giving the correct value.	
	b		18	1	**Examiner's Comments** A very common error was an answer of 72, displaying confusion between the terms 'factor' and 'multiple'. Several candidates gave answers which were not in the list from which they were supposed to choose.	
	c		17	1	**Examiner's Comments** This question was well answered with the majority of candidates giving the correct value.	
			Total	3		
7	a	i	28	1		
		ii	26	1		
		iii	29	1	**Examiner's Comments** The first two parts were often correct. Identifying the prime number in (a)(iii) proved to be a problem with incorrect answers of 25 and 27 being common.	
	b		125	1	Condone 5 on answer line if 25 × 5 = 125 seen in body of script **Examiner's Comments** This was answered well.	
			Total	4		

Question			Answer/Indicative content	Marks	Part marks and guidance	
8	a		30 or 35	1	**Examiner's Comments** This part was answered well by most students.	
	b		36	1	**Examiner's Comments** Whilst a small majority correctly gave 36 as their answer, many gave answers that were not square numbers, with 30 being the most common error.	Not 6^2
	c		31 or 37	1	**Examiner's Comments** Most candidates appeared to be unsure of what a prime number actually is. 33 and 39 were common errors, whilst other candidates again gave values outside the given range.	
			Total	**3**		
9			Any two of 1, 2, 5 or 10	1	**Examiner's Comments** Well answered with 2 and 5 being given most frequently. Incorrect responses usually involved multiples of 10.	Condone extra if correct
			Total	**1**		

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Question			Answer/Indicative content	Marks	Part marks and guidance	
10	a	i	24	1	**Examiner's Comments** Multiples were well understood with nearly all candidates giving a correct answer.	
		ii	25	1	**Examiner's Comments** Candidates were aware of the definition of square numbers. Some developed a pattern of finding 2 × 2, 3 × 3 etc and most were able to give a correct answer. A common error was to give an answer of 20 rather than 25.	
		iii	27	1	**Examiner's Comments** Cube numbers were less well understood although there were still many candidates who found the correct answer.	

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Question			Answer/Indicative content	Marks	Part marks and guidance	
		iv	23	1	**Examiner's Comments** Although there were quite a few correct answers, there were some candidates who did not understand the definition of prime numbers and gave an even number as an answer. Others gave an answer of 21 or 27 rather than 23, suggesting that they did have some idea but were unable to find the appropriate factors of these numbers.	
	b		21 and 28	1	**Examiner's Comments** Common factors were well understood with most candidates giving a correct answer.	
			Total	5		

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Question			Answer/Indicative content	Marks	Part marks and guidance	
11	a		32, 34, 36, 38	1	with no extras	
	b		35	1	with no extras **Examiner's Comments** Multiples are well understood and most responses were correct in parts (a) and (b).	
	c		31, 37	2	**1** each with no extras **SC1** for two correct and one incorrect **Examiner's Comments** On the other hand, prime numbers were not well recognised. Candidates generally knew that they would be odd numbers, but answers of 33 and 39 were common, not recognising that these are multiples of 3 and hence not prime.	one correct and one incorrect scores no marks
			Total	4		

Question			Answer/Indicative content	Marks	Part marks and guidance	
12		i	$2^5 \times 3$ Or $2 \times 2 \times 2 \times 2 \times 2 \times 3$ or better	2	**M1** for correct factor pair or product seen or attempt at factor tree / ladder with at least two steps or answer $2^k \times 3$ **oe** **OR** **SC1** for 2, 2, 2, 2, 2, 3 identified but not as product	Condone 3^1 for 2 or 1 marks May be part of factor tree or e.g. $4 \times 8 \times 3$ May contain errors
		ii	12 final answer	2	**B1** for 2, 2, 3 clearly identified for both 96 and 108 or answer of 2, 3, 4 or 6 **oe** **Examiner's Comments** Most candidates could not write a number as the product of its prime factors in part (i) or find the highest common factor in part (ii). Some attempted to break down 96 into factors in part (i) and obtained a part mark from attempting a tree diagram or finding a factor pair. Others found a common factor as their solution in part (ii), for which they were awarded a mark.	e.g. in a Venn diagram e.g. accept 2^2 for B1
			Total	4		

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Question			Answer/Indicative content	Marks	Part marks and guidance	
13	a		42	1	**Examiner's Comments** Almost all candidates answered parts (a) and (b) correctly, with the most common error to give 27 as a square number. Part (c) was more challenging. Many identified the correct three numbers, but additionally included 39. Some stated a large selection from the original list, usually the odd numbers, and simply wrote them in numerical order. It was also common to see just two of the prime numbers listed, usually 11 with either 23 or 41.	
	b		81	1		
	c		11, 23 and 41	2	**B1** for 2 or 3 correct with no more than 1 incorrect	
			Total	4		

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Question			Answer/Indicative content	Marks	Part marks and guidance		
14			$2 \times 5 \times 7^2$ oe	2	**B1 for** only 2, 5 and 7 identified **or** **M1 for** any correct factor pair of 490	Condone inclusion of 1 for **B1** Not 1 and 490	
					Examiner's Comments The majority gave a correct answer in part (a) and many of the rest scored one mark for a correct product, usually as a start to a factor tree. Some found all the correct factors, but failed to use them in a product in the response, responding either with an addition of them or leaving them as individual factors. In part (b) the most successful method was by listing departure times. The main error was due to using 100 minutes in an hour. A few found the LCM was 200, but found it difficult to change this into hours and minutes and add it to 9:00am.		
			Total	2			

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Question			Answer/Indicative content	Marks	Part marks and guidance		
15			12 and 30	3	**M2** for a complete factor list of 60 e.g. [1] 2,3,4,5,6,10, 12,15, 20,30 [60] or **M1** for the list with at most two errors or [6] 12, 18, 24, 30 [36…] or **B1** for 2 numbers with a HCF of 6 or LCM of 60	May be seen as products eg 2 × 30 Error, omission or repeat Eg 6 and 12, 12 and 18, 18 and 24 Eg 4 and 15, 10 and 12, 20 and 30	
					Examiner's Comment Some candidates wrote 12 and 30 with no working, which scored full marks. It was much more common however to see extended working, often in the form of factor trees, lists or factor products, although this working was often disorganised. Candidates who gave two numbers part satisfying the conditions, such as 12 and 18 (which have a HCF of 6) or 10 and 12 (which have an LCM of 60), scored 1 mark. Few listed all the factors of 60.		

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Question			Answer/Indicative content	Marks	Part marks and guidance
			Total	3	

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