testbase

Factors and Multiples

Name: _____

Class: _____

Date: _____

Time:

Marks: **51 marks**

Comments:

1. Circle any number that is a multiple of **both** 3 and 7.

27 37 42 49

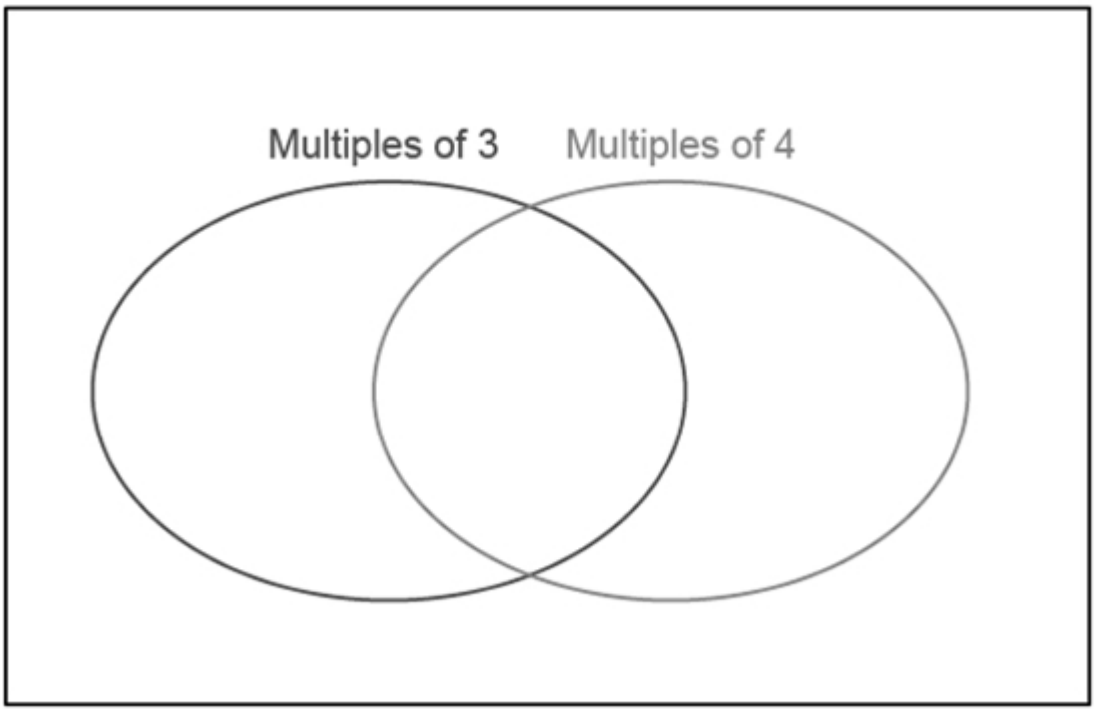
1 mark

2. Circle the numbers that are **multiples of 3**.

16 18 23 9 24

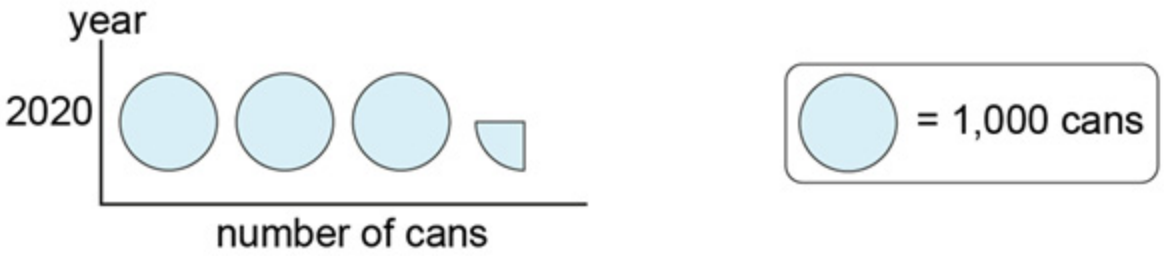
1 mark

3. Write all the numbers from **1** to **30** in the correct places on this Venn diagram.



2 marks

4. The pictogram shows how many cans a class recycled in 2020.



How many cans did the class recycle in 2020?

1 mark

5. Circle the lengths that could be made using 1 metre (100cm) sticks.

3,100cm 1,005cm 6,600cm 7,090cm 1,000cm

1 mark

6. Circle the multiples of 4.

14 24 40 34 16 32 25

1 mark

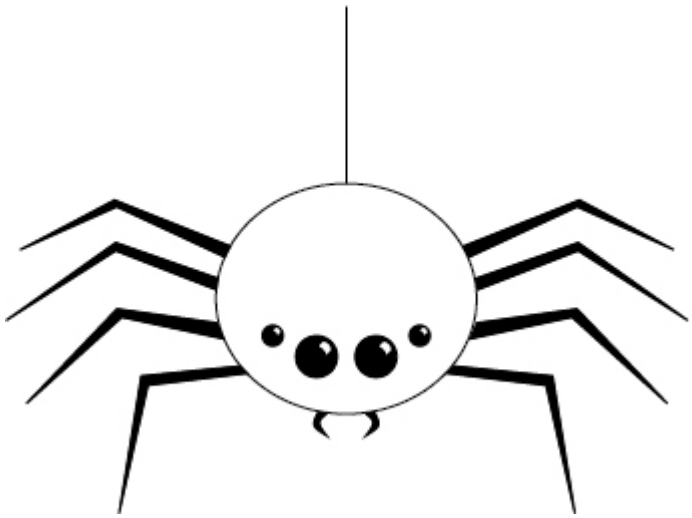
7. A book costs **£5**.

How much do **6** books cost?

£

1 mark

8. A spider has **8** legs.



If there are **5** spiders, how many legs are there altogether?

1 mark

9. Stan counts from 0 in **multiples of 25**.

Circle the numbers he will say.

100 25 240 155

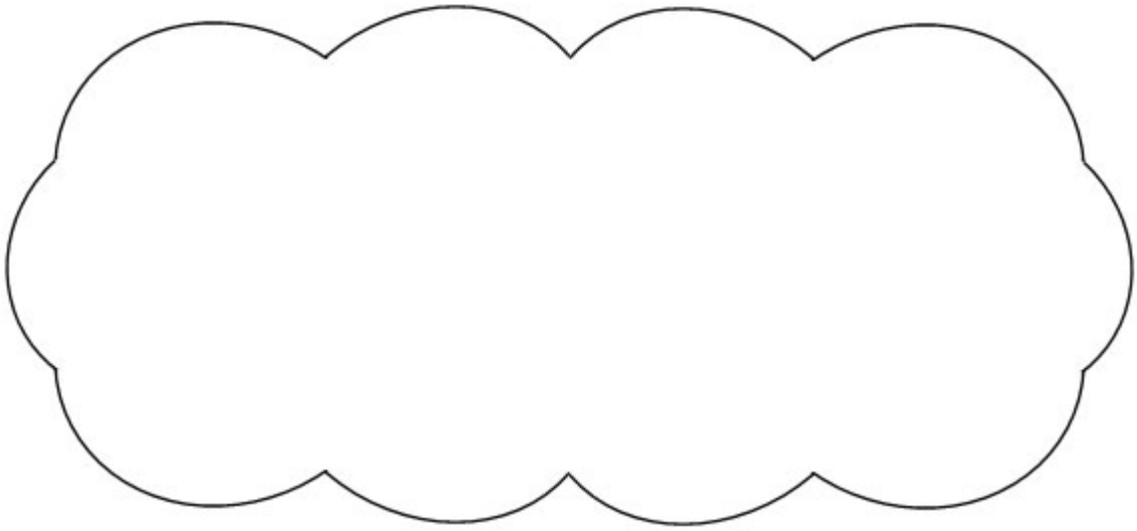
400 275 505 350

1 mark

10. Circle the numbers that are **multiples of 10**.

640 300 105 510 330 409 100 864

Explain your answer.



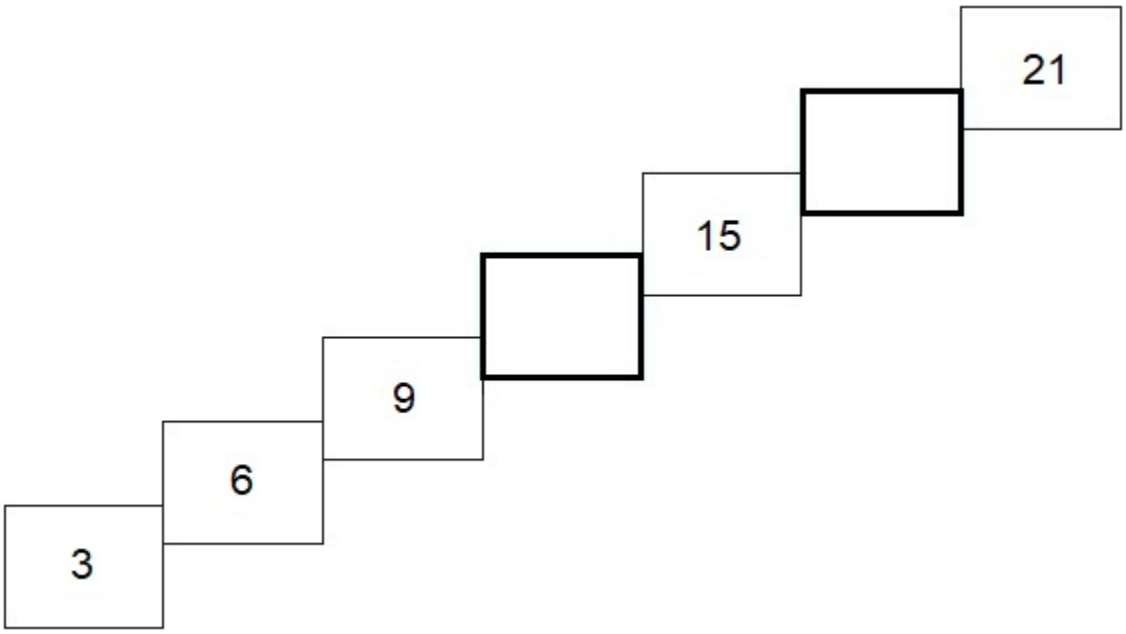
2 marks

11. Fill in the two missing numbers in this sequence.

28	**24**	**20**		**12**	**8**		**0**

1 mark

12. Write the missing numbers in this pattern.



1 mark

13. Put a ring around the number which **cannot** be divided exactly by **10**

60 110

80

120 90

101

1 mark

14.

There are **1000** pieces in a puzzle.

12 pieces go missing.

How many pieces are left?

	pieces

1 mark

15. **Sequence**

A sequence of numbers starts at the number 12

The numbers **increase by 4** each time.

12	16	20	24	28	...

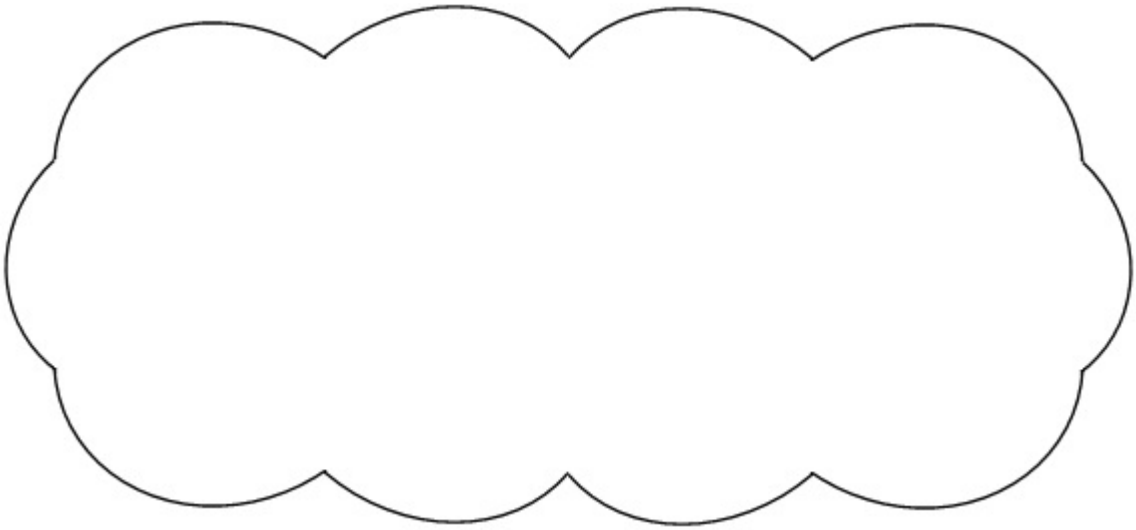
The sequence keeps going forever.

(a) Will the number **39** be in the sequence?

Tick (✓) Yes or No.

Yes ☐ No ☐

Explain your answer.



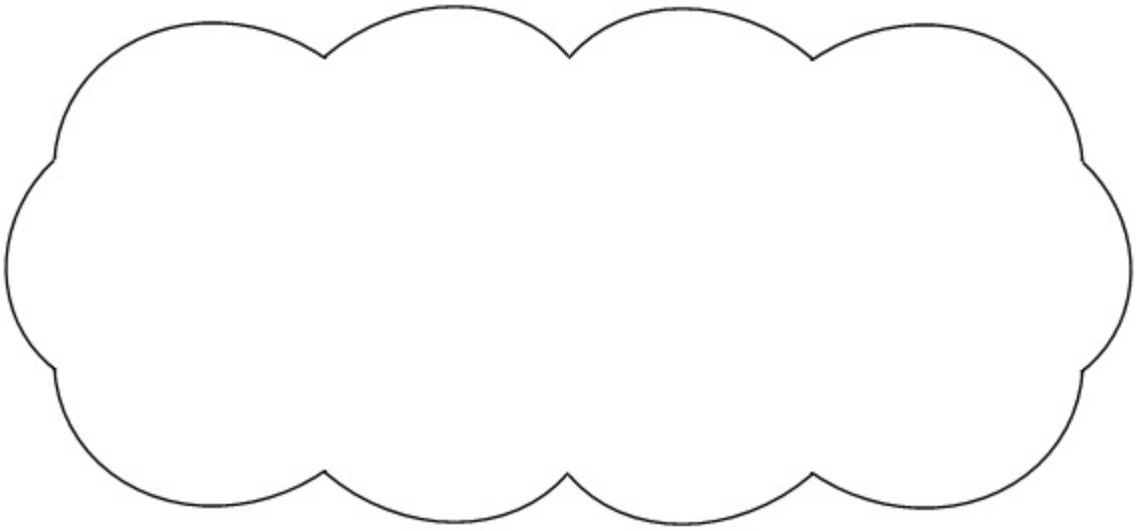
1 mark

(b) Will the number **100** be in the sequence?

Tick (✓) Yes or No.

Yes ☐ No ☐

Explain your answer.



1 mark

16. Write

always	sometimes	or	never

in each box to make the sentences correct.

Multiples of **2** ☐ end in **3**

Multiples of **5** ☐ end in **5**

Multiples of **10** ☐ end in **0**

1 mark

17. Here is a grid with some numbers shaded.

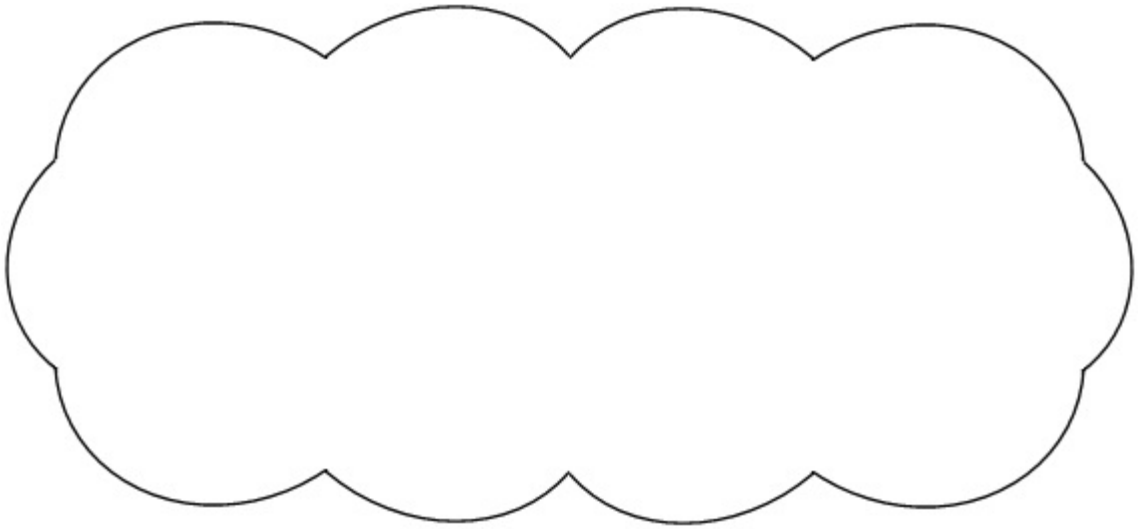
1	2	3	4
5	6	7	8
9	10	11	12

The grid continues.

Will the number **35** be **shaded**?

Yes ☐ No ☐

Explain your answer.



1 mark

18. **Write a number**

(a) Write a number that is **both**

greater than 10	**and**	a multiple of 4

1 mark

(b) Now write a number that is **both**

greater than 10	**and**	a square number

1 mark

19. Bananas cost **25p** each.

How many bananas can Joe buy for **£1.75**?

1 mark

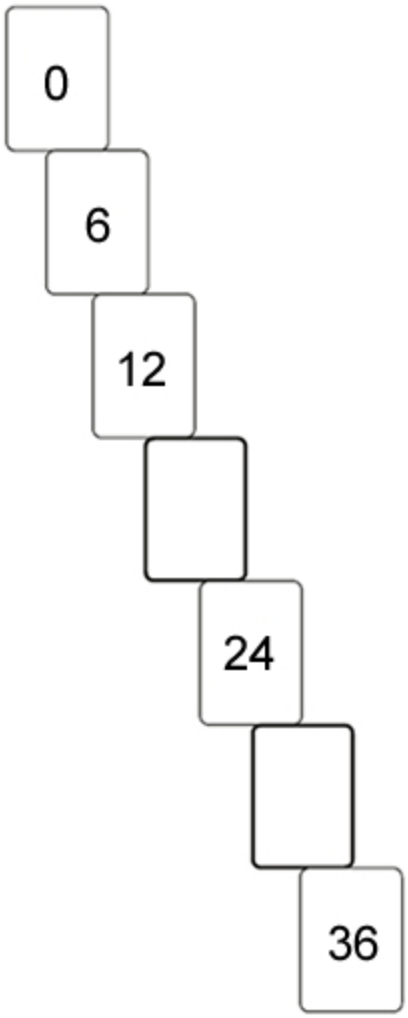
20. Circle the numbers that are **multiples of 4**

16 42 20

34 48

1 mark

21. Write the **two** missing numbers in this pattern.



1 mark

22. Doug and Lily are buying supplies for a school trip.

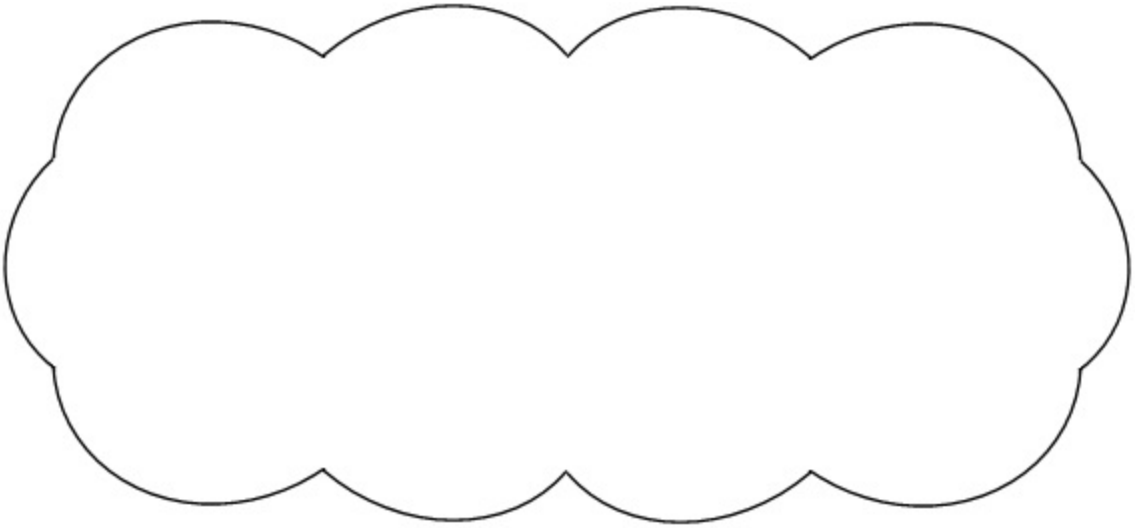
Doug buys **8** packs of apple juice cartons.

Lily buys **4** packs of orange juice cartons.

Doug says,

'I have four times as many cartons as Lily.'

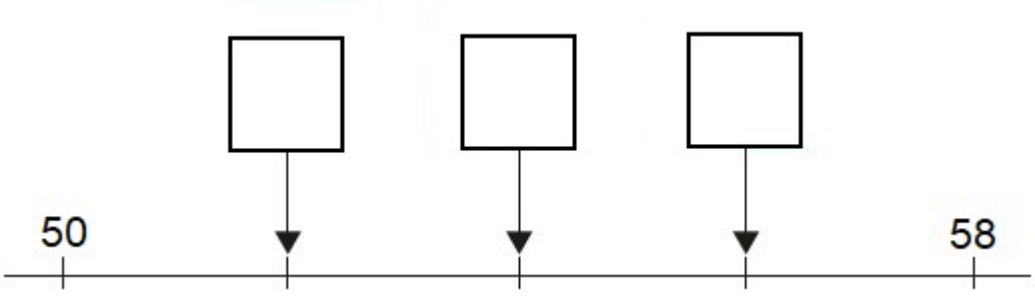
Explain why Doug is correct.



1 mark

23. The numbers on this number line go up by the **same amount** each time.

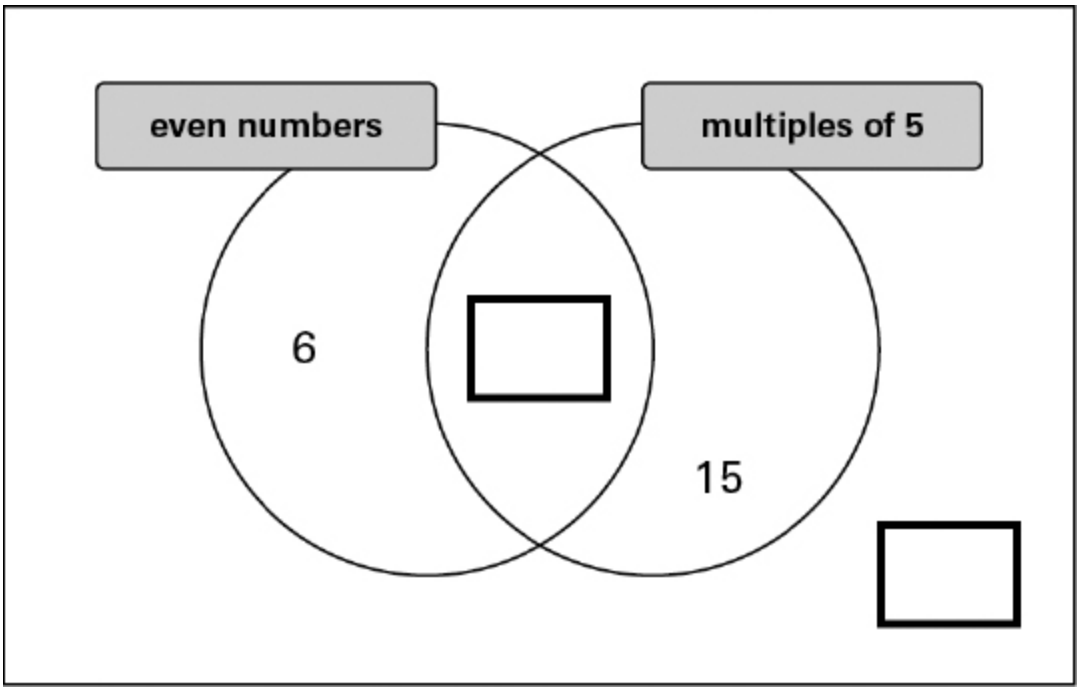
Write the missing numbers in the boxes.



1 mark

24. Here is a sorting diagram.

Write a correct number in each of the two boxes.



1 mark

25. Circle **all** the numbers that are **one more than a multiple of 4**

11 17 25 34 40 49

1 mark

26. This statement is **not true**.

'A multiple of 10 added to a multiple of 10 always makes a multiple of 20'

Give an example to show why this statement is **not true**.

_____

1 mark

27. Here is a table.

The tick (✓) in the box shows that **20** is a multiple of **10**

Put **four more** ticks (✓) to complete the the table.

	12	15	20
multiple of **10**			✓
multiple of **2**			
multiple of **5**			

2 marks

28. Here is a number chart that goes up in fives.

5	10	15	20	25
30	35	40	45	50
55	60	65	70	75
80	85	90	95	100
105	110	115	120	125

The chart continues in the same way.

One of the numbers below will be at the **start** of a **row** on the chart.
Circle the number.

445 455 465 475 485

1 mark

One of the numbers below will be at the **end** of a **row** on the chart.
Circle the number.

345 355 365 375 385

1 mark

29. Zak has **more than 10** counters and **fewer than 20** counters.

When he groups them in **threes** no counters are left over.

How many counters could Zak have?

1 mark

30. Circle **all** the numbers that are **multiples of four**.

8 24 5 30 12

1 mark

31. Fill in the missing numbers.

$6 \times 32 = 6 \times 4 \times$

$6 \times 5 \times 4 = 5 \times$

$480 = 8 \times 10 \times$

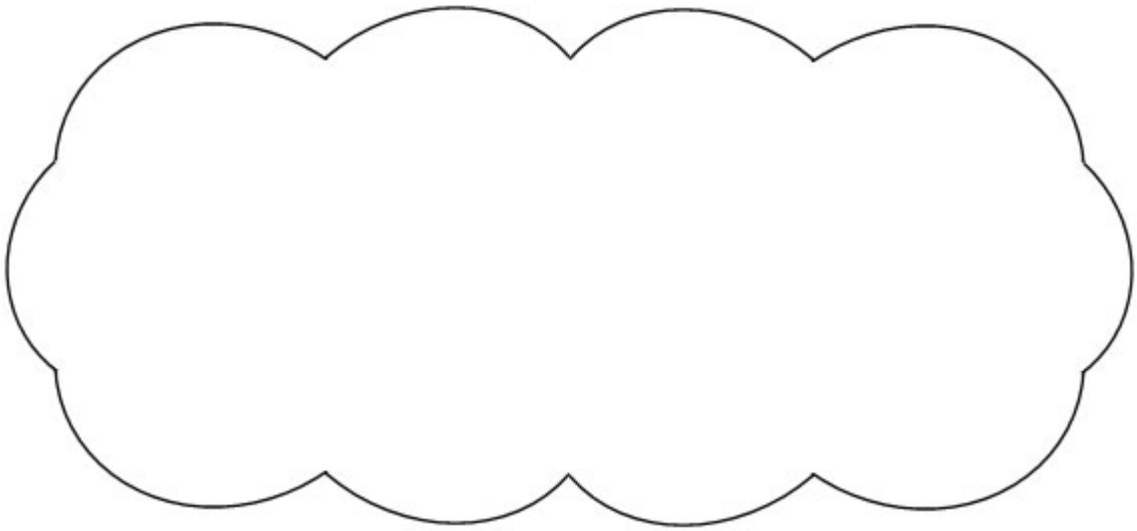
$72 = 2 \times 6 \times$

$\square \times 5 \times \square = 105$

$7 \times \square \times \square = 140$

2 marks

32. Show that 3 is a factor of 231.



1 mark

33. Write two 2-digit factors of 270.

$\square$ and $\square$

1 mark

34. Circle any number that is a factor of **both** 24 and 36.

2 4 6 8 10 12

1 mark

35. Find a common factor of 48 and 64 that is **greater than 6**.

1 mark

36. Pupils should already know and be able to use the words ‘multiple’ and ‘factor’ in the context of the multiplication tables. They should know, for example, that the products within the 6 multiplication table are all multiples of 6, and should be familiar with the generalisation: factor × factor = product.

In year 5, pupils should learn the definitions of the terms ‘multiple’ and ‘factor’, and understand the inverse relationship between them.

Language focus

“A multiple of a given number is the product of the given number and any whole number.”

“A factor of a given number is a whole number that the given number can be divided by without giving a remainder.”

“21 is a multiple of 3. 3 is a factor of 21.”

Pupils must be able to identify factors and multiples within the multiplication tables, and should learn to work systematically to identify all of the factors of a given number. They should be able to express products in the multiplication tables as products of 3 factors, where relevant, for example, 48 = 2 × 3 × 8.

Pupils already know how to scale known multiplication table facts by 10 or 100 (**3NF–3** and **4NF–3**), and must now learn to apply this to identify factors and multiples of larger numbers, as exemplified below.

7 × 3 = 21 7 × 300 = 2,100 700 × 3 = 2,100

Language focus

“21 is a multiple of 3, so…

- 2,100 is a multiple of 300”
- 2,100 is a multiple of 3”

Pupils should learn to express multiples of 10 or 100 as products of 3 factors, for example:

7 × 3 = 21
so
7 × 3 × 10 = 210

Pupils should learn that these factors can be written in any order (commutative property of multiplication) and that any pair of the factors can be multiplied together first (associative property of multiplication).

Applying commutativity	Applying associativity (example)
3 × 7 × 10 = 210 3 × 10 × 7 = 210 7 × 3 × 10 = 210 7 × 10 × 3 = 210 10 × 3 × 7 = 210 10 × 7 × 3 = 210	3 × 7 × 10 = 210 (3 × 7) × 10 = 21 × 10 = 210 3 × (7 × 10) = 3 × 70 = 210

Pupils should be able to recognise whether any given number is a multiple of 2, 5, or 10 by attending to the final digit and, conversely, recognise 2, 5, or 10 as factors.

Pupils should also be able to recognise multiples and factors linked to their experience of dividing powers of 10 into 2, 4 or 5 equal parts, by attending to the appropriate digit(s), for example:

- 175 is a multiple of 25 (attending to the final 2 digits) 25 is a factor of 175
- 8,500 is a multiple of 500 (attending to the final 3 digits) 500 is factor of 8,500
- 380 is a multiple of 20 (attending to the final 2 digits) 20 is a factor of 380

Pupils should learn to identify factors and multiples for situations other than those described above by using short division or divisibility rules. For example, to determine whether 392 is a multiple of 8 (or whether 8 is a factor of 392) pupils can use the divisibility rule for 8 or use short division to determine whether 392 ÷ 8 results in a quotient without a remainder.

Pupils must learn how to find common factors and common multiples of small numbers in preparation for simplifying fractions and finding common denominators. They must also learn to recognise and use squared numbers and use the correct notation (for example, $3^2 = 9$), and learn to establish whether a given number (up to 100) is prime.

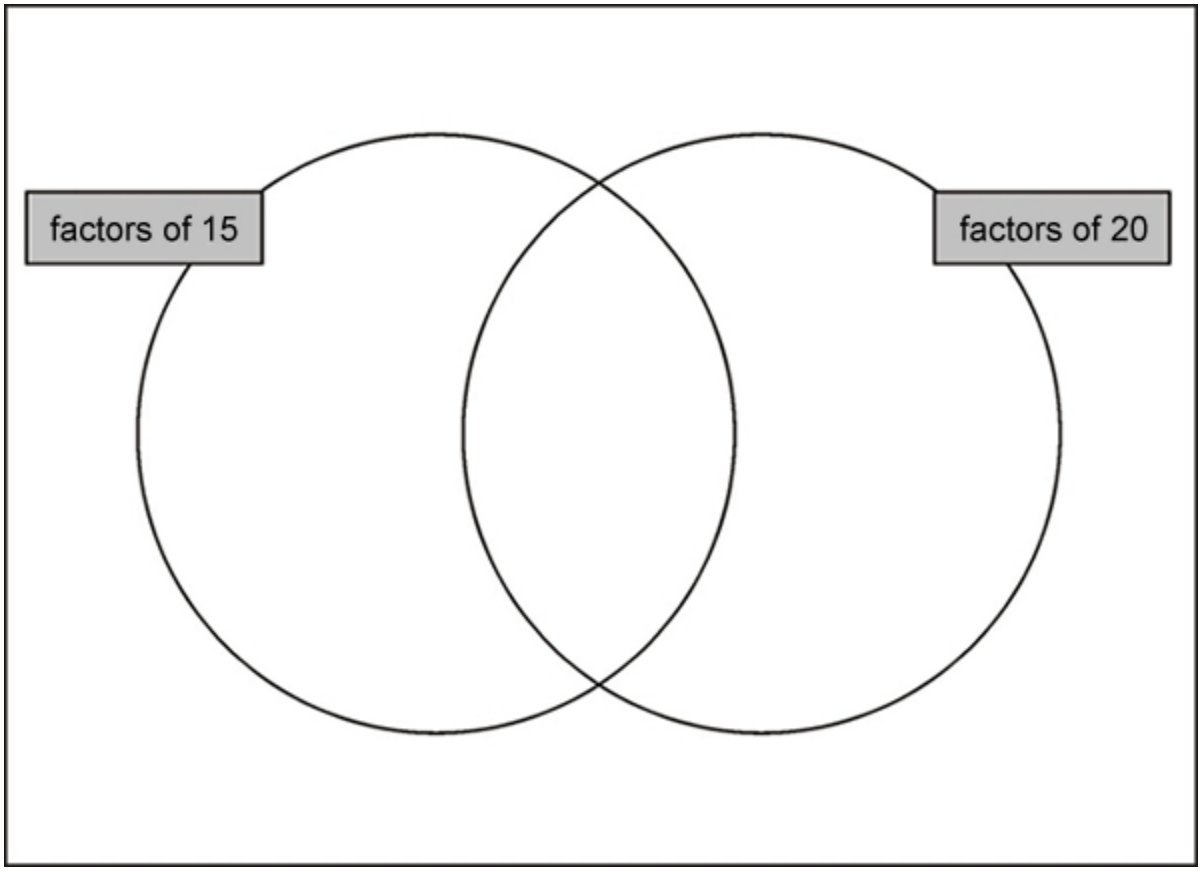
Making connections

Pupils must be fluent in their multiplication tables to meet this criterion (**5NF–1**), and must also be able to scale multiplication facts by 10 or 100.

Short division (**5MD–4**) can be used to identify factors when other strategies are not applicable.

37. Write these numbers in the correct places on the diagram.

3 **4** **5** **6**

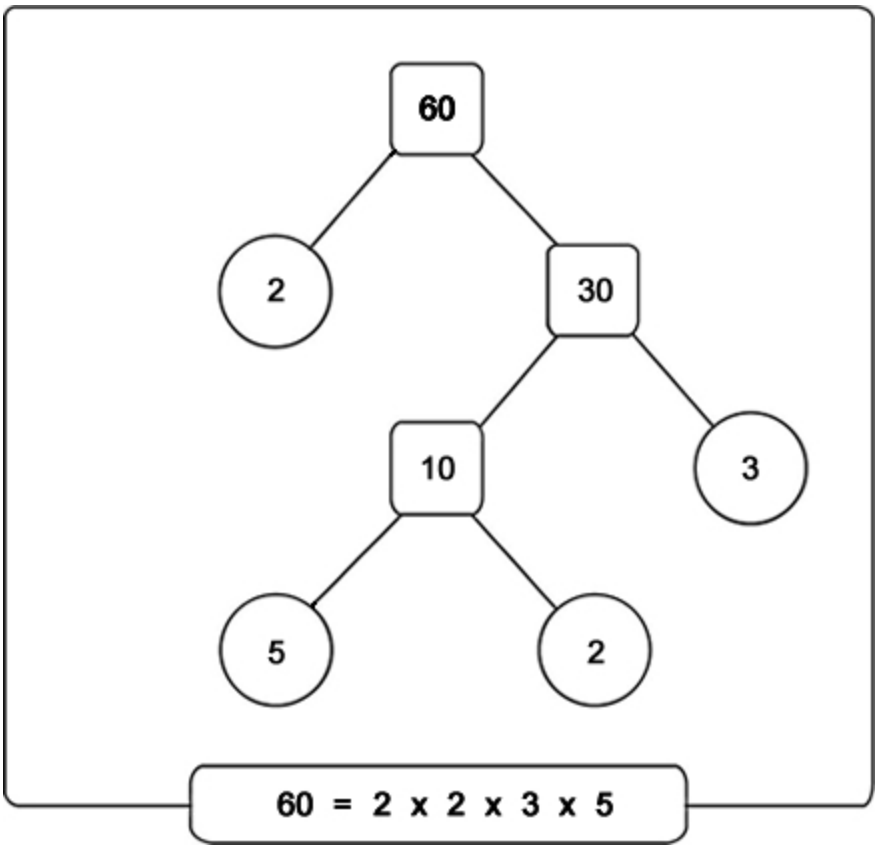


2 marks

38. **Prime factors**

You can write any whole number as a product of its prime factors.

Here is an example for the number 60:



Write **225** as a product of its prime factors.

Show your method

225 =

2 marks

39. **Multiplication square**

Complete these multiplication squares.

×	6	9
3	18	____
8	____	____

2 marks

×	____	____
____	28	24
____	63	54

2 marks

40. **18** socks are put into pairs.

How many pairs are there?

1 mark

Mark schemes

1. Number circled as shown:

Accept alternative unambiguous indications, eg number ticked, crossed or underlined.

[1]

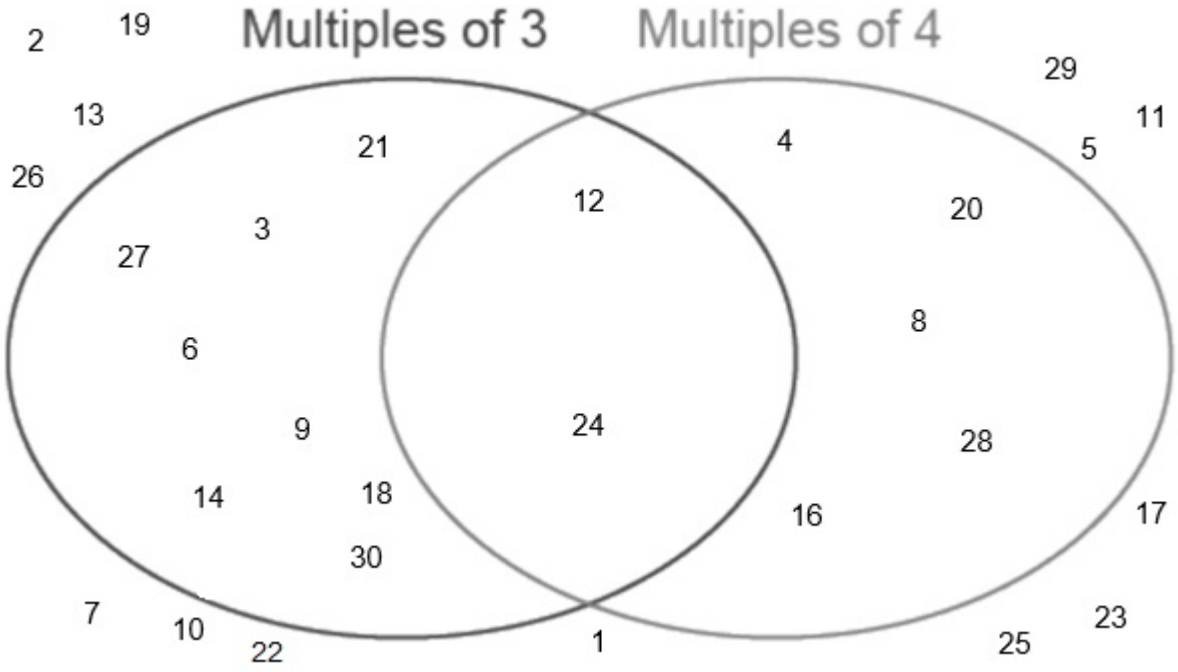
2. Three numbers circled as shown:

***Do not** award the mark if additional incorrect numbers are circled.*
Accept alternative unambiguous indications, eg numbers ticked, crossed or underlined.

Assessment guidance: The multiplication tables check will assess pupils' fluency. Once pupils can automatically recall multiplication facts, they should be able to apply their knowledge to questions like those shown here.

[1]

3. Award **TWO** marks for all numbers correctly placed as shown:



If the answer is incorrect, award **ONE** mark for any 28 or 29 correct.

***Do not** accept numbers written in more than one region.*

Up to 2m

[2???]

4. 3,250

[1]

5. All multiples of 100 circled, as shown:

Do not *award the mark if additional incorrect numbers are circled.*
Accept alternative unambiguous indications, eg numbers ticked, crossed or underlined.

[1]

6. All four numbers circled as shown:

No mark is awarded if any other numbers are circled.

Assessment guidance: The multiplication tables check in year 4 will assess pupils' fluency in all multiplication tables. At this stage, teachers should assess fluency in facts within the 10, 5, 2, 4 and 8 multiplication tables. Once pupils can automatically recall multiplication facts, and have covered criterion 3MD–1, they should be able to apply their knowledge to contextual questions like those shown here. Teachers should ensure that pupils answer these questions using automatic recall of the appropriate multiplication facts – for question 1, for example, if a pupil counts up in multiples of 8, or draws 5 spiders and counts the legs in ones, the pupil has not met this criterion.

[1]

7. £30

Assessment guidance: The multiplication tables check in year 4 will assess pupils' fluency in all multiplication tables. At this stage, teachers should assess fluency in facts within the 10, 5, 2, 4 and 8 multiplication tables. Once pupils can automatically recall multiplication facts, and have covered criterion 3MD–1, they should be able to apply their knowledge to contextual questions like those shown here. Teachers should ensure that pupils answer these questions using automatic recall of the appropriate multiplication facts – for question 1, for example, if a pupil counts up in multiples of 8, or draws 5 spiders and counts the legs in ones, the pupil has not met this criterion.

[1]

8. 40

Assessment guidance: The multiplication tables check in year 4 will assess pupils' fluency in all multiplication tables. At this stage, teachers should assess fluency in facts within the 10, 5, 2, 4 and 8 multiplication tables. Once pupils can automatically recall multiplication facts, and have covered criterion 3MD–1, they should be able to apply their knowledge to contextual questions like those shown here. Teachers should ensure that pupils answer these questions using automatic recall of the appropriate multiplication facts – for question 1, for example, if a pupil counts up in multiples of 8, or draws 5 spiders and counts the legs in ones, the pupil has not met this criterion.

[1]

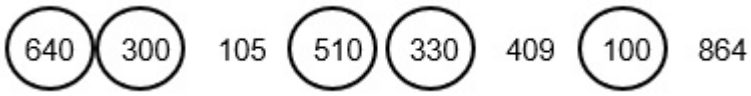
9. All five correct or any four of the following indicated, as shown:

Do not *award the mark if additional incorrect numbers are circled.*

Accept alternative unambiguous indications, e.g., numbers ticked, crossed or underlined.

[1]

10. Award **ONE** mark for correctly identifying multiples of 10 as shown and **ONE** mark for a correct explanation recognising that all multiples of 10 have 0 ones (end in 0).



- Multiples of 10 end in 0
- Multiples of 10 have no ones as only the number of tens is increasing

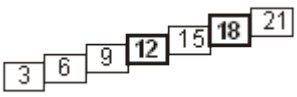
[2]

11.
28 24 20 16
12 8 4 0

If 16 and 4 not in frame but elsewhere in this question, and the intention is clear, award the mark.

[1]

12. Missing numbers written as shown:



Both numbers must be correct for the award of the mark.

[1]

13. Ring around 101

Accept any other clear way of indicating the correct answer.

[1]

14. 988 (pieces)

[1]

15. (a) Indicates No and gives a correct explanation, eg

- All the numbers in the sequence are multiples of 4, but 39 is not
- It is an odd number but all the numbers in the sequence are even

Accept minimally acceptable explanation, eg

- *It's not in the 4 times table*
- *39 ÷ 4 = 9 remainder 3*
- *4 doesn't go into 39*
- *It is odd*
- *It goes 32, 36 then 40*
- *Keep adding 4 and you won't get there*
- *28 + 12 = 40*
- *36 + 4 doesn't give 39*
- *It should be 40, not 39*
- *It does not end in 2, 6, 0, 4 or 8*

Do not accept incomplete or incorrect explanation, eg

- *All the numbers in the sequence are multiples of 4*
- *The numbers in the sequence are even*
- *Keep adding 4*
- *You won't get to 39*
- *Because 9 is not in the four times table*
- *39 is not a factor of 4*

U1

(b) Indicates Yes and gives a correct explanation, eg

- The numbers in the sequence are the multiples of 4, and 100 is a multiple of 4
- The numbers in the sequence are all those divisible by 4 and 100 ÷ 4 = 25

Accept minimally acceptable explanation, eg

- *It's a multiple of 4*
- *It's in the 4 times table*
- *4 goes into 100*
- *25 × 4*

! ***Explanation uses a number in the sequence that is*** *less than 100 to work up to 100*

As this sequence would include zero if extended, condone unambiguous methods using multiplication

eg, accept

- *20 is in the sequence and 20 × 5 = 100*
- *5 × 4 = 20, 20 × 4 = 80 and 20 + 80 = 100*

Do not accept methods using counting on only
eg, do not accept

- *It goes 88, 92, 96, 100*
- *I kept adding 4 and got to 100*

Do not accept incomplete or incorrect explanation, eg

- *All the numbers in the sequence are multiples of 4*
- *The numbers end in 2, 6, 0, 4, or 8 100 ends in a 0*
- *100 will divide exactly*
- *100 is even*
- *It ends in a zero*
- *100 is a factor of 4*

U1

[2]

16. The correct word written to complete each sentence as shown:

Multiples of **2**	never	end in **3**
Multiples of **5**	sometimes	end in **5**
Multiples of **10**	always	end in **0**

All three sentences must be completed correctly for the award of the mark.
Accept any reasonable spelling.
Accept also 'a', 's', or 'n' written in the boxes instead of 'always', 'sometimes' or 'never'.

[1]

17. Indicates No and gives a correct explanation

The most common correct explanations:

Reason generally about odd/even numbers, eg

- Only even numbers are shaded and 35 is odd
- 35 isn't divisible by 2, but all the shaded numbers are

Use counting on, eg

- (3, 7, 11,) 15, 19, 23, 27, 31, 35
-

	14		16
	18		20
	22		4
	26		28
	30		32
	34		36

! Explanation contains an incorrect statement

Ignore alongside a correct response

Accept minimally acceptable explanation, eg

- *They are even*
- *It is odd*
- *It's not in the 2 times table*

Do not accept incomplete explanation, eg

- *35 won't be in a shaded column*
- *It goes up in 4s (or 2s)*
- *It's not in the 4 times table*

Accept minimally acceptable explanation that at least shows or implies that 34 or 36 will be shaded, eg

- *35 will be in the third column*
- *Numbers ending in 5 have white squares*
- *Keep adding 4 to 11 and you get 35*
- *34 will be shaded, so 35 can't be*
- *36 is, so 35 can't be*

Do not accept incomplete explanation, eg

- *Just count on*

U1

[1]

18. (a) Gives a number that is both greater than 10 and a multiple of 4, eg

- 12
- 16
- 40
- 140

1

(b) Gives a number that is both greater than 10 and a square number, eg

- 16
- 25
- 100

1

[2]

19. 7

1

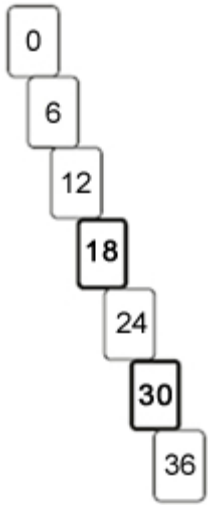
[1]

20. Rings around 16, 20 and 48

All three numbers must be indicated for the award of the mark.
Accept any other clear way of indicating the correct numbers.
***Do not** award the mark if other numbers are indicated unless it is clear that the correct three are the child's final choice.*

[1]

21. Pattern completed as shown:



Both numbers must be correct for the award of the mark.

[1]

22. An explanation that shows Doug has four times as many cartons as Lily, e.g.

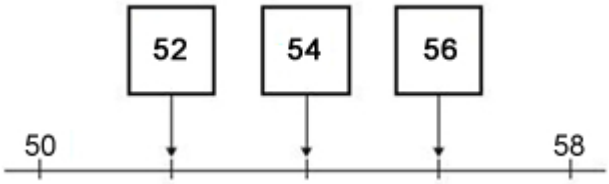
- 24 × 8 is 4 times as many as 12 × 4
- 192 is four times 48
- 192 ÷ 4 = 48
- 192 ÷ 48 = 4
- 48 × 4 = 192
- Doug buys twice as many packs of twice as many cartons, so it's doubled twice
- 24 is double 12 and 8 is double 4, so it's doubled twice
- Lily buys half the amount of packs and each pack has half the number of cartons, so she has $\frac{1}{4}$ of the amount.

***Do not** accept vague or incomplete explanations, e.g.*

- *Doug buys more packs and there are more cartons in each bag*
- *Doug buys twice as many packs of twice as many cartons*
- *24 is double 12 and 8 is double 4.*

[1]

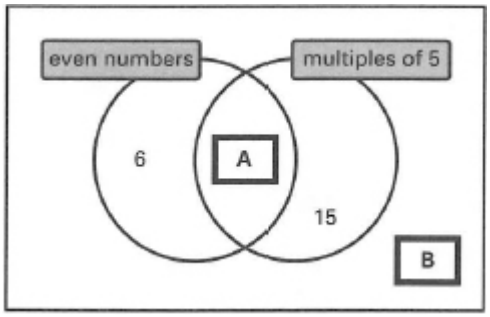
23. All three numbers correct, as shown:



If the answer boxes are empty, accept the correct values written in the correct order elsewhere on the page.

[1]

24. Boxes completed as shown:



Box A: any multiple of 10, eg 10, 50, 120

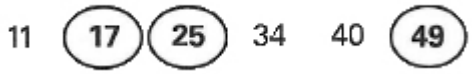
AND

Box B: any number ending in a 1, 3, 7 or 9

***Both** answers must be correct for the award of the mark.*
If answers are written in the answer boxes, disregard any additional numbers written elsewhere on the diagram.
If no answers are written in the answer boxes, accept correct answers written in the relevant two regions of the diagram provided that all numbers written in the two regions are correct.

[1]

25. Three numbers circled as shown:



***All three** numbers must be correct for the award of the mark.*

Accept any other clear way of indicating the correct numbers, such as ticking or underlining.

[1]

26. An example that shows two multiples of 10 totalling a number that is not a multiple of 20, eg:

10 + 20 = 30

OR

60 + 30 = 90

Accept a correct example without a total, eg 10 + 20
***Do not** accept a total without exemplification of how this total was reached, eg 30*

U1

[1]

27. Table completed as shown:

	12	15	20
multiple of **10**			✓
multiple of 2	✓		✓
multiple of 5		✓	✓

***All four** ticks must be placed correctly for the award of **TWO** marks.*
Accept alternative unambiguous indications, such as 'Y' and 'N'.
If both marks are awarded, record by entering 1 in each marking space.

If the answer is incorrect, award **ONE** mark for at least three ticks correctly placed and no more than one tick incorrect.

*Award **ONE** mark by entering 1, 0 in the marking spaces.*

Up to 2m

[2]

28. (a) One number circled as shown:

445 **(455)** 465 475 485

Accept any other clear way of indicating the correct number, such as ticking or underlining.

U1
1

(b) One number circled as shown:

345 355 365 **(375)** 385

Accept any other clear way of indicating the correct number, such as ticking or underlining.

U1
1

[2]

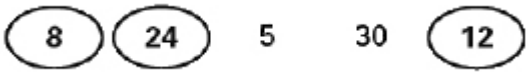
29. 12 **OR** 15 **OR** 18

Award the mark if more than one answer is given, provided all are correct.

U1

[1]

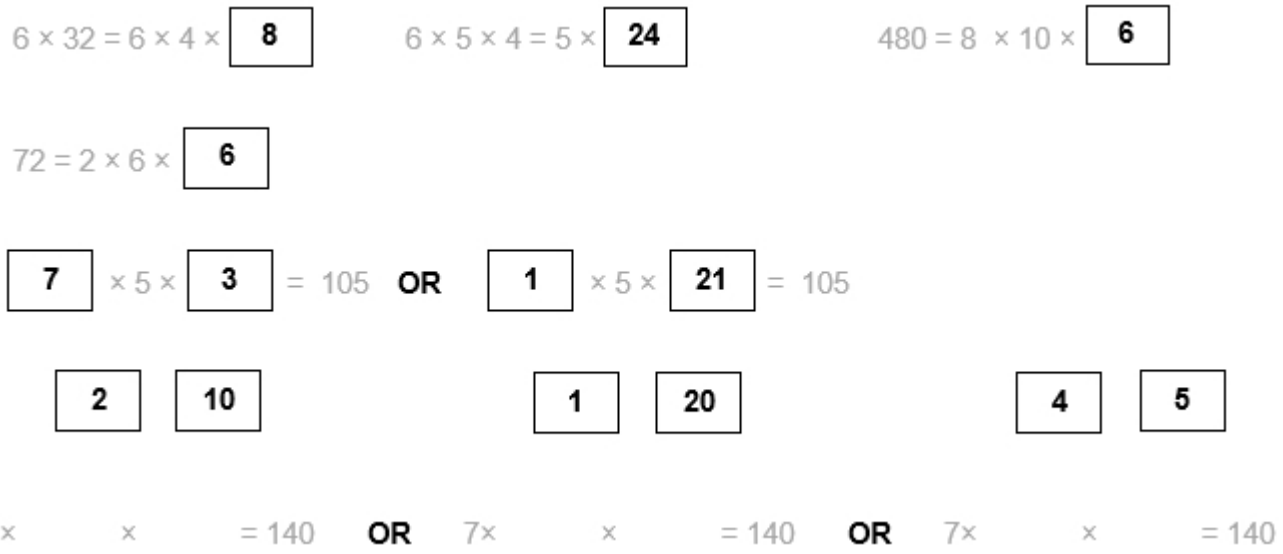
30. Three numbers circled as shown:



***All three** numbers must be correct for the award of the mark.*
Accept any other clear way of indicating the correct numbers, such as ticking or underlining.

[1]

31. Award **TWO** marks for all correct, as shown:

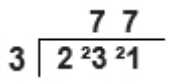


If the answer is incorrect, award **ONE** mark for any 4 or 5 equations correct.

Up to 2m

[2]

32. Award **ONE** mark for a correct explanation / method that shows that 231 can be divided by 3 without leaving a remainder, e.g



- Short division
- Use division fact − 2 + 3 + 1 = 6, 6 is a multiple of 3, so 231 is a multiple of 3, and so 3 is a factor of 231.

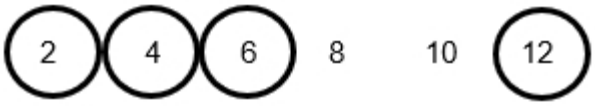
[1]

33. 10, 15, 18, 27, 30, 45, 54 or 90

Award **ONE** mark for any two of the above.

[1]

34. Award **ONE** mark that circles any one or all of the numbers as shown:



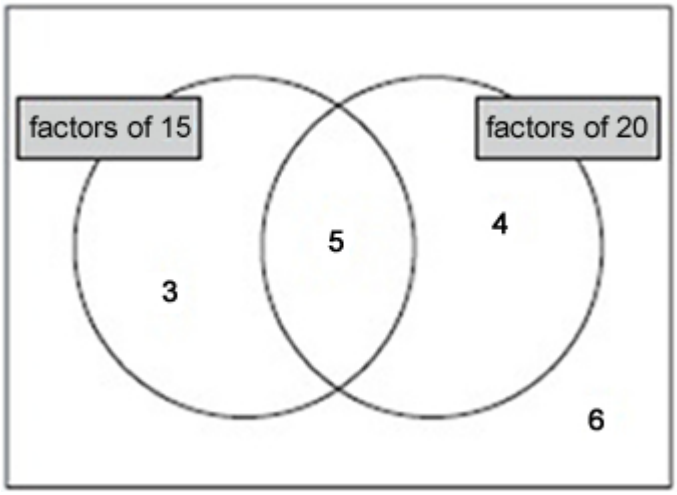
Accept alternative unambiguous indications, eg number(s) ticked, crossed or underlined.

[1]

35. e.g., 8, 16 accept any correct answer

[1]

37. Award **TWO** marks for numbers written in the correct regions as shown:



If the answer is incorrect, award **ONE** mark for any three numbers written in the correct regions.

Do not *accept numbers written in more than one region.*

Up to 2m

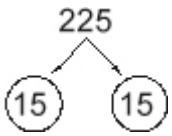
[2]

38. Gives 225 as a product of its prime factors, eg

- $5^2 \times 3^2$
- $3 \times 5 \times 5 \times 3$

2

or Shows or implies that 225 can be written as a product of at least two positive integers, other than 1 and 225, eg

- 3×75
- 45×5
- 25×9
- $225 \div 5 = 45$
- $3, 3, 5, 5$
- 

1

[2]

39. Gives all three correct values in the correct positions, ie

×	6	9
3	18	**27**
8	**48**	**72**

2

or Gives any two correct values in the correct positions

1

Gives all four correct values in the correct positions, ie

×	**7**	**6**
4	28	24
9	63	54

2 (U1)

or Gives at least two correct values in the correct positions

1

[4]

40. 9

Assessment guidance: The multiplication tables check in year 4 will assess pupils' fluency in all multiplication tables. At this stage, teachers should assess fluency in facts within the 10, 5, 2, 4 and 8 multiplication tables. Once pupils can automatically recall multiplication facts, and have covered criterion 3MD–1, they should be able to apply their knowledge to contextual questions like those shown here. Teachers should ensure that pupils answer these questions using automatic recall of the appropriate multiplication facts – for question 1, for example, if a pupil counts up in multiples of 8, or draws 5 spiders and counts the legs in ones, the pupil has not met this criterion.

[1]