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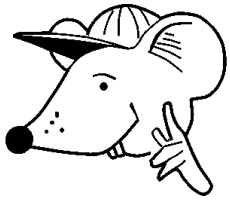
MATHEMATICS



N.S. Yr. 5 P.81

Make and investigate general statements about numbers and shapes

Equipment

Paper, pencil, calculator, angle measure.

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Concepts

Children should be able to spot a relationship between variables in a situation or, if they are given a relationship, they should be able to investigate it to show that it is true.

Examples can be taken from any aspect of the syllabus, but may typically include the following:

A number that is a multiple of **a** and a multiple of **b** is also a multiple of **a × b.**

Rules and results arising from the product of different combination of numbers.

Division is not commutative (ie. $6 \div 3 \neq 3 \div 6$). Children do not need to know the word 'commutative'.

Properties of angles on a straight line.

Using general ideas to find the perimeters of shapes.

Develop rules for sequences.

Children should also be able to describe in words or on paper how they would calculate a question. E.g. How would you calculate how much change is due from a £5 note if 8 items at 40p are bought?

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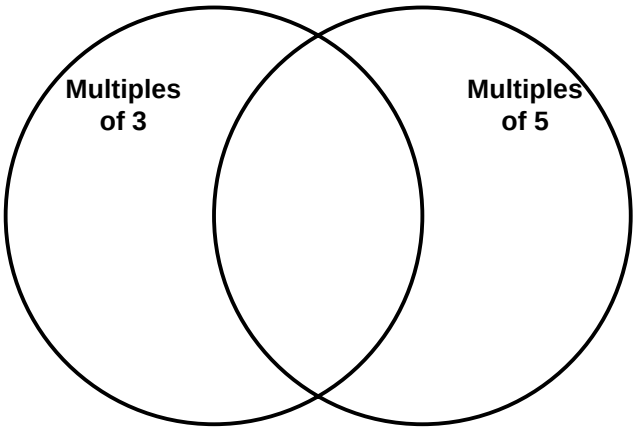
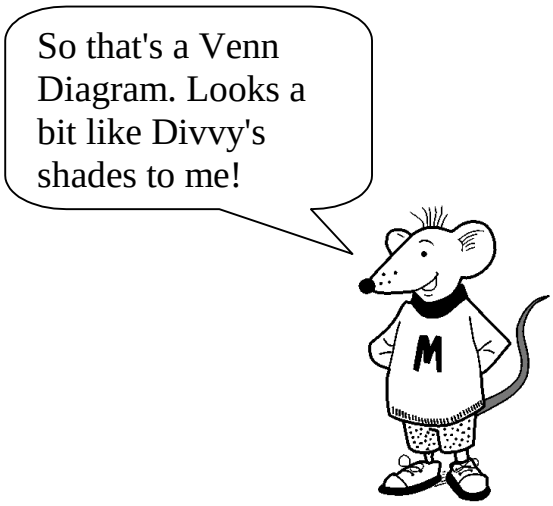
1. Put these numbers in the correct places in the Venn Diagram:

9, 12, 15, 20, 25, 30, 36, 42, 45, 55





What can you say about the numbers in the middle section of the Venn Diagram?

Complete this sentence:

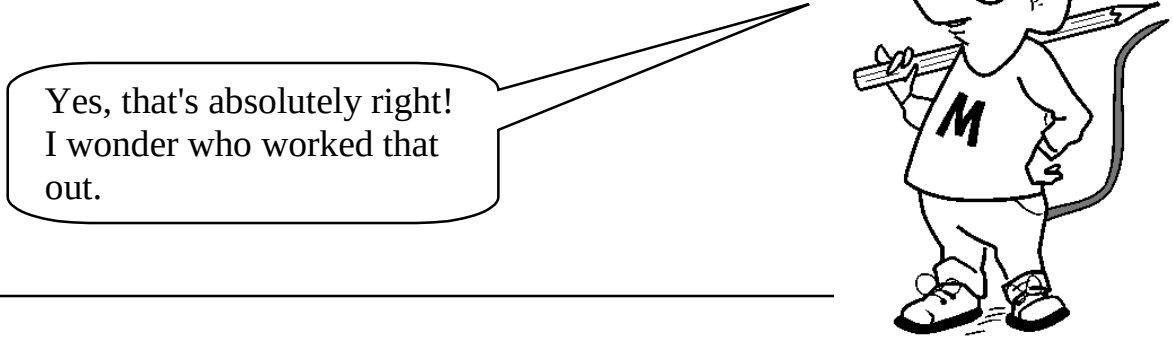
Numbers that are multiples of 3 and multiples of 5 are also multiples of _____.

2. You can tell if a number is a multiple of **9** if its digits add up to a multiple of **9**.

E.g. **15 822** is a multiple of **9** because its digits add up to **18**, which is a multiple of **9**.

Which of these numbers are multiples of **9** ?

27, 360, 546, 12 543, 25 587, 706 610



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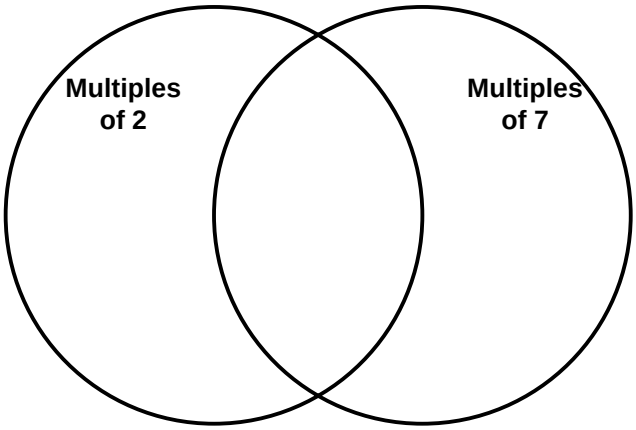
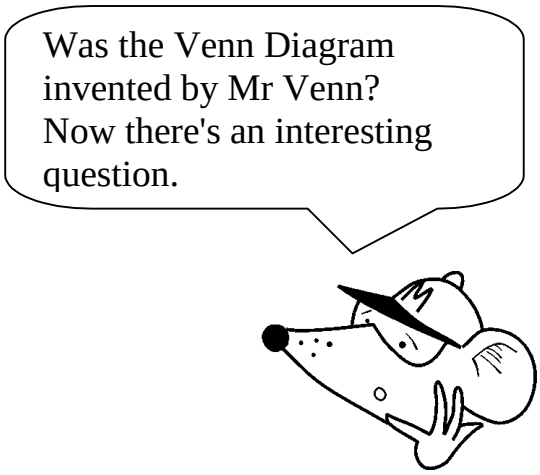
1. Put these numbers in the correct places in the Venn Diagram:

4, 7, 14, 16, 28, 35, 42, 46, 56





What can you say about the numbers in the middle section of the Venn Diagram?

Complete this sentence:

Numbers that are multiples of **2** and multiples of **7** are also multiples of _____.

2. We can use the idea in question **1.** in reverse. Complete this sentence:

If a number is a multiple of **14**, it is also a multiple of _____ and _____.

Now complete these sentences:

If a number is a multiple of **35**, it is also a multiple of _____ and _____.

If a number is a multiple of **22**, it is also a multiple of _____ and _____.

If a number is a multiple of **10**, it is also a multiple of _____ and _____.

If a number is a multiple of **21**, it is also a multiple of _____ and _____.

If a number is a multiple of **55**, it is also a multiple of _____ and _____.

If a number is a multiple of **26**, it is also a multiple of _____ and _____.

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1.

Here's an interesting question.
What type of number do you get if you multiply two consecutive numbers together?

I don't understand the question, Divvy.

Okay, here are some pairs of consecutive numbers:

4, 5 **10, 11** **13, 14** **23, 24** **37, 38** **42, 43**

Try multiplying them together:

4 × 5 = _____ **10 × 11 =** _____ **13 × 14 =** _____

23 × 24 = _____ **37 × 38 =** _____ **42 × 43 =** _____

What type of number do you always get? Why is this?

2. When you have finished question **1.**, find out what happens when you multiply two consecutive even numbers together.

Here are some examples to try:

2 × 4 = _____ **8 × 10 =** _____ **12 × 14 =** _____

16 × 18 = _____ **20 × 22 =** _____ **34 × 36 =** _____

What type of number do you always get? Why is this?

3. Now find out what happens when you multiply two consecutive odd numbers together. (Eg **13 × 15**)

Make up more of your own examples to try.

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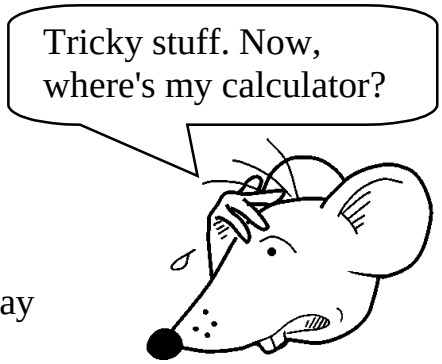
1. Is it true that it does not matter which way you add two numbers?

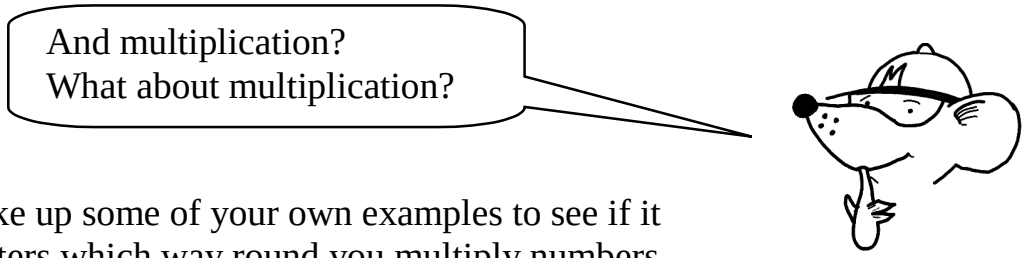
For example, is **4 + 5** the same as **5 + 4** ?
What about **243 + 973** and **973 + 243** ?



2. What about subtraction? Does it matter which way you subtract two numbers?

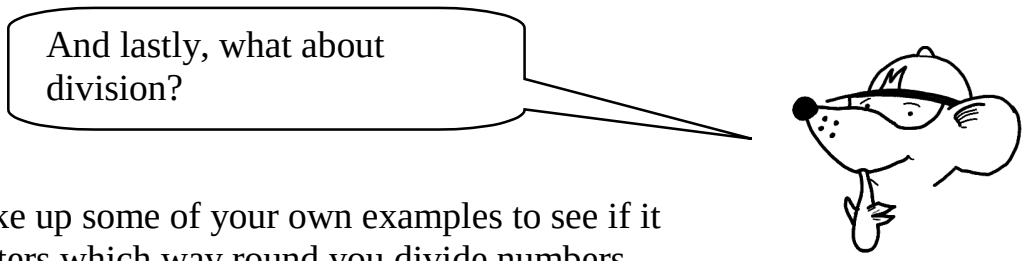
For example, is **12 – 3** the same as **3 – 12** ?
What about **835 – 537** and **537 – 835** ?

3.



Make up some of your own examples to see if it matters which way round you multiply numbers.

4.



Make up some of your own examples to see if it matters which way round you divide numbers.
You will probably need a calculator

5. Can you complete the table to show what you have found?

Statement	True or false
153 + 538 = 538 + 153	
684 – 426 = 426 – 684	
427 × 733 = 733 × 427	
608 ÷ 32 = 32 ÷ 608	

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1.

Measure the two angles in diagram **A**. Add them up.

Do the same for diagram **B**.

Draw some more diagrams like this and measure both angles. Add them up.

What do you notice? Can you find an example that does not work?

2. What is the perimeter of a square that has a side 8cm long?
How did you work out your answer?

3. What is the perimeter of a square that has a side 6.5cm long?
How did you work out your answer?

4. Divvy buys 8 pencils costing 23p each. He pays with a £5 note.
Explain how to calculate how much change he gets.

_____

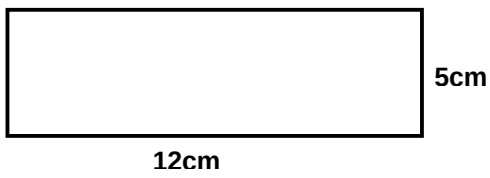
_____

5. Explain how to find the area of a rectangle.

_____

_____

What is the area of a rectangle 12cm long and 5cm wide?



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1. What is the rule for this sequence?

3, 7, 15, 31, 63, ...

_____

What are the next four terms in the sequence?

2. What is the rule for this sequence?

5, 15, 45, 135, ...

_____

What are the next four terms in the sequence?

3. What is the rule for this sequence?

13, 29, 61, 125, 253 ...

_____

What number comes before **13** in the sequence?

What number comes after **253** ?

4. A boy's hair is 8cm long. It grows at 2cm a month. Explain how to calculate how long his hair will be after 5 months.

5. Explain how to divide a number by ten.

_____

_____

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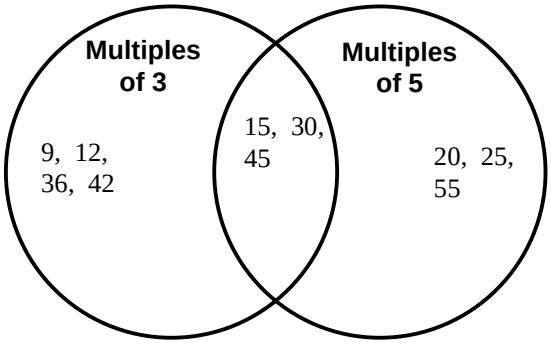
Answers

Page 3

In some of these questions an explanation is asked for. Allow any correct and properly formulated explanation.

1.

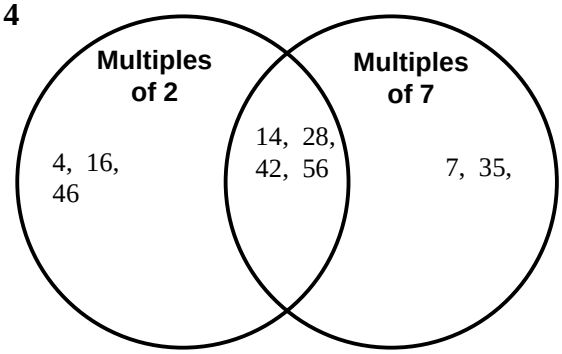


The numbers in the middle section are multiples of 15.
Numbers that are multiples of 3 and multiples of 5 are also multiples of **15**.

2. 27, 360, 25 587

Page 4

1.



The numbers in the middle section are multiples of 14.
Numbers that are multiples of 2 and multiples of 7 are also multiples of **14**.

2. If a number is a multiple of 14, it is also a multiple of 2 and 7.
If a number is a multiple of 35, it is also a multiple of 5 and 7.
If a number is a multiple of 22, it is also a multiple of 2 and 11.
If a number is a multiple of 10, it is also a multiple of 2 and 5.
If a number is a multiple of 21, it is also a multiple of 3 and 7.
If a number is a multiple of 55, it is also a multiple of 5 and 11.
If a number is a multiple of 26, it is also a multiple of 2 and 13.

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Answers (Contd)

Page 5

1. $4 \times 5 = 20$ $10 \times 11 = 110$ $13 \times 14 = 182$

$23 \times 24 = 552$ $37 \times 38 = 1\,406$ $42 \times 43 = 1\,806$

You always get an even number.
If you choose two consecutive numbers, one must be even, the other odd. If you multiply any whole number by an even number, the answer is always even.

2. $2 \times 4 = 8$ $8 \times 10 = 80$ $12 \times 14 = 168$

$16 \times 18 = 288$ $20 \times 22 = 440$ $34 \times 36 = 1\,224$

You always get an even number.
If you multiply an even number by any other whole number, you always get an even number.

Some children may spot that the answer is also always a multiple of 4 because even numbers are multiples of 2 and we know from previous pages that multiplying two multiples of 2 must give a multiple of 4, just as a multiple of 3 multiplied by a multiple of 5 gives a multiple of 15.

3. Multiplying two odd numbers gives an odd number. Children should have given suitable examples to back this up.

Page 6

1. $4 + 5 = 9$; $5 + 4 = 9$
$243 + 973 = 1\,216$; $973 + 243 = 1\,216$
It does not matter which way round numbers are added.

2. It does matter which way round numbers are subtracted since $12 - 3$ is not the same as $3 - 12$ etc.

3. It does not matter which way round numbers are multiplied since 13×5 is the same as 5×13, for example.

4. It does matter which way round numbers are divided since $15 \div 5$ is not the same as $5 \div 15$, for example.

5.

$153 + 538 = 538 + 153$	True
$684 - 426 = 426 - 684$	False
$427 \times 733 = 733 \times 427$	True
$608 \div 32 = 32 \div 608$	False

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Answers (Contd)

Page 7

1. $50^0 + 130^0 = 180^0$
$123^0 + 57^0 = 180^0$

The two angles always add up to 180^0

2. 32cm 8cm × 4 = 32cm

3. 26cm 6.5cm × 4 = 26cm

4. £3.16 23p × 8 = 184p or £1.84
£5.00 – £1.84 = £3.16
Any suitable explanation.

5. Multiply the length by the width. $60cm^2$

Page 8

1. Start at 3, add 4, add 8, add 16, doubling the difference each time.
127, 255, 511, 1 023.

2. Start at 5 and keep multiplying by 3.
405, 1 215, 3 645, 10 935

3. Start at 13. Double and add 3.
509, 1 021, 2 045, 4 093

4. The length of his hair will be 8cm + (2cm × 5) = 8cm

5. Move the digits one place to the right.