Contents

Introduction

This pack provides all you need to prepare your Year 6 pupils for the end of KS2 national tests. All of the material is photocopiable and can be used for class work or homework purposes.

In this pack, you will find:

- Two full sets of specimen SATS papers. One set is arranged using the Ma criteria and the other set comprises randomly organised questions such as pupils will experience in the actual tests. The set arranged by topic may be used piecemeal to support teaching by topic as diagnostic material before administering the mock test or after the mock test to provide additional practice in any process which a pupil finds difficult. Two sets of mental maths question papers and their associated pupil response sheets are also included.
- A useful bank of additional practice questions.
- A set of more difficult problems designed to stretch the more able pupil and to provide more practice in the skills associated with Ma1. Although the mathematical knowledge to solve these problems may range from level three to five, most of the questions will probably require problem solving strategies available mainly to children achieving an attainment grade of a high four or five.
- A pupil's record sheet to be completed by the teacher, containing a check list of skills needed for the KS2 SATS set out by level and by Ma criteria. Tick boxes provide a quick, clear record of an individual pupil's attainments and needs. In addition, pupils can be encouraged to share in the record keeping process by completing a simplified version, based on the results of the diagnostic tests and the teacher's own judgement. This enables them to monitor their own progress, and to be encouraged by this, and thus they can decide, in partnership with the teacher, where extra help is needed. Teachers may also find the sheet useful in identifying groups of pupils making similar errors, or having similar difficulties.
- A page of commonly used Mathematical words and terms needed by the pupil at KS2 complete with questions for the pupil to practise using the terminology and to check understanding.
- Answers to all exercises and questions.

We hope that teachers will find this pack a useful adjunct to their teaching material, to provide both extra practice where needed and to stretch the abilities of their more able candidates.

Introduction

Interpreting the test results

Each paper carries a total of 100 marks, 40 for each of tests A and B and 20 for each mental maths test. The table below indicates the level at which pupils are working according to their scores out of 100.

Mark range	Level
0-15	N
16-18	2
19-44	3
45-75	4
76-100	5

Note that these levels are intended as guides only, as questions and criteria may vary slightly from year to year. However, they are a good indicator of the likely level of achievement in KS2 Tests.

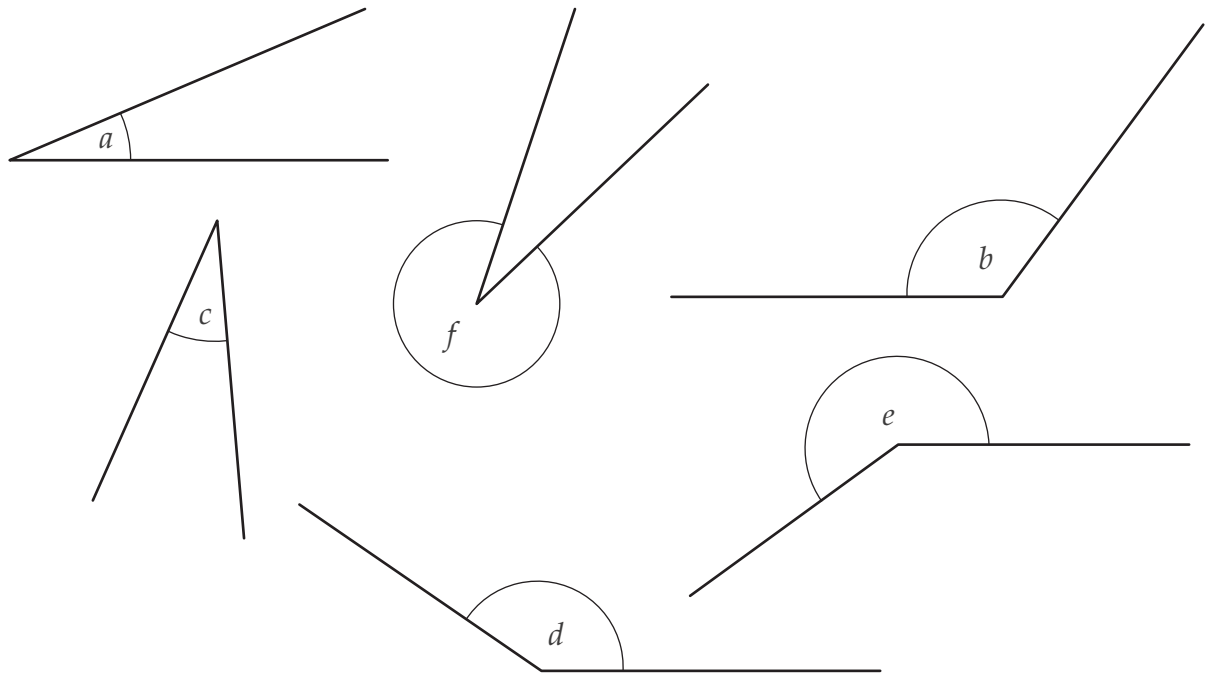
Answers

Answers to exercises and exam questions begin on page 93.

Useful words (a)

The following terms frequently appear on test papers. Here each is explained for you and there is a practice question to check that you have understood it.

Angles:
Acute angle: an angle that is less than 90 degrees.
Obtuse angle: a number that is bigger than 90 degrees but smaller than 180 degrees.
Reflex angle: an angle that is larger than 180 degrees but smaller than 360 degrees.



Angles _____ and _____ are acute angles.

Angles _____ and _____ are obtuse angles.

Angle _____ and angle _____ are reflex angles.

Averages:
The mean: add all the values together and divide by the number of values that you have.

The mean of 3, 8, 12, 5 and 2 is _____ .

The median: arrange all the values in order of size and pick the middle value.

The median value of 3, 8, 12, 5 and 2 is _____ .

If you have an even number of values, the median is halfway between the middle two values when placed in order of size.

The median value of 6, 4, 9, 8, 12 and 14 is _____ .

The mode: the most frequently occurring value.

The mode of 20, 15, 18, 23 and 20 is _____ .

Useful words (b)

Others:

Convert: change something from one form to another.

Convert $\frac{1}{2}$ to a decimal. _____ .

Denominator: the bottom number of a fraction.

The denominator of $\frac{1}{4}$ is _____ .

Equivalent fractions: two or more fractions which are equal in value.

Draw lines joining up the equivalent fractions.

$\frac{3}{4}$ $\frac{5}{10}$

$\frac{1}{2}$ $\frac{2}{3}$

$\frac{6}{9}$ $\frac{9}{16}$

Factor: a whole number which divides into another number without leaving a remainder.

The factors of 30 are _____ . (Remember that 1 and 30 are factors of 30.)

Highest common factor: the largest number which will divide into two or more numbers without leaving a remainder.

The highest common factor of 8 and 12 is _____ .

Lowest common multiple: the smallest number into which two or more numbers will divide without leaving a remainder. This is also the lowest common denominator of two or more fractions.

The lowest common multiple of 2, 3, 4 and 8 is _____ .

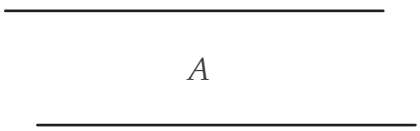
Useful words (c)

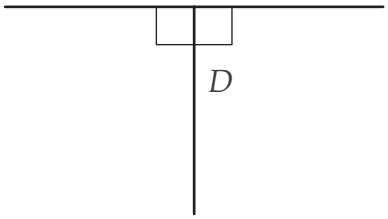
Numerator: the top number of a fraction.

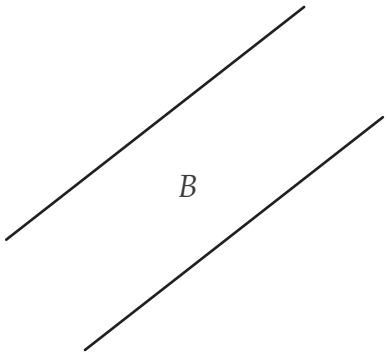
The numerator of $\frac{2}{3}$ is _____ .

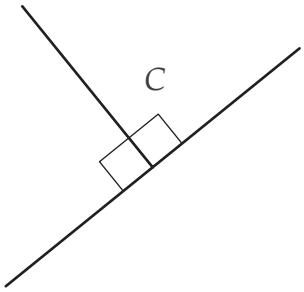
Parallel: lines that are the same distance apart whatever their length.

Perpendicular: lines that meet at right angles are perpendicular.









Diagrams _____ and _____ show parallel lines.

Diagrams _____ and _____ show lines which are perpendicular to each other.

Prime number: a whole number that has exactly two factors, itself and one.

In the list 2, 3, 8, 13, 96, the prime numbers are _____ , _____ and _____ .

Product: the result of two or more numbers that are multiplied together.

The product of 4 and 5 is _____ .

Range: the difference between the highest and lowest values. In a list of data, subtract the smallest value from the largest.

Using the numbers 3, 8, 12, 5, 9, the range is _____ .

Useful words (d)

Square number: a number multiplied by itself gives a square number.

In the list 1, 16, 20 and 24, _____ and _____ are square numbers.

Square root: the number that has been multiplied by itself to give a square number.

_____ is the square root of 100. _____ is the square root of 25.

Subtract: take away.

If you subtract 4 from 10, the answer is _____ .

If you subtract 10 from 4, the answer is _____ .

Sum: add.

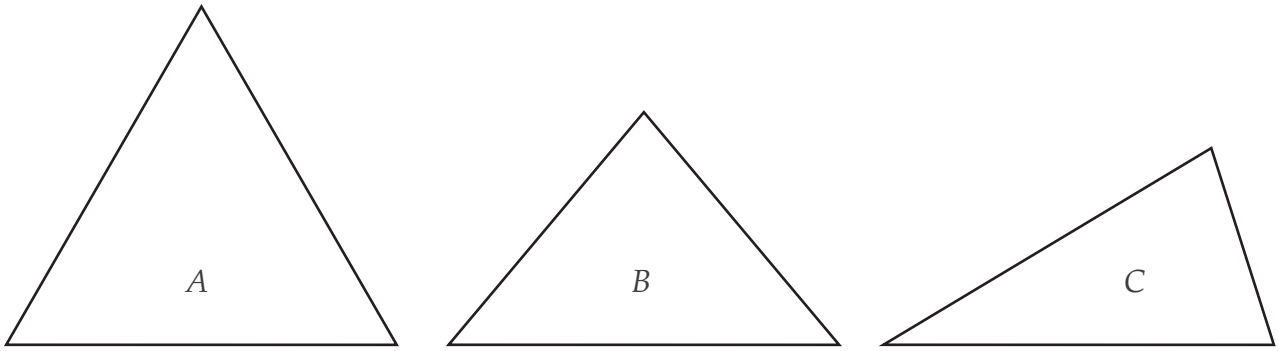
The sum of 6 and 4 is _____ .

Triangle: a shape with three straight sides.

An equilateral triangle has all its sides the same length, and each of its angles is 60°.

An isosceles triangle has two sides the same length and two angles the same size.

A scalene triangle is one where each side and angle is a different size.



Triangle _____ is equilateral.

Triangle _____ is isosceles.

Triangle _____ is scalene.

EXTRA PRACTICE QUESTIONS

1. Find the value of the following:

a) $6 - 4 =$ ☐

b) $^{-}8 + 3 =$ ☐

c) $2 - 10 =$ ☐

d) $^{-}5 - 2 =$ ☐

e) $^{-}6 + 6 =$ ☐

f) $2 - {}^{-}1 =$ ☐

g) $3 + {}^{-}5 =$ ☐

h) $^{-}2 - 3 =$ ☐

2. a) Round 247 to the nearest 10. ☐

b) Round 35 142 to the nearest 100. ☐

c) Round 24 589 to the nearest 1000. ☐

d) Round 61 445 to the nearest 100. ☐

3. Look at the set of numbers:

1 2 4 10 20 27 29

a) Write down two prime numbers. ☐ ☐

b) Write down two square numbers. ☐ ☐

c) Write down two multiples of five. ☐ ☐

d) Write down two factors of fifty. ☐ ☐

4. Look at the set of numbers:

113 128 130 222 225 248

a) Write down two numbers that are divisible by two. ☐ ☐

Give a reason why these numbers are divisible by two.

. . . . . .

b) Write down two numbers that are divisible by three. ☐ ☐

Give a reason why these numbers are divisible by three.

. . . . . .

c) Write down two numbers that are divisible by four. ☐ ☐

Give a reason why these numbers are divisible by four.

. . . . . .

d) Write down two numbers that are divisible by five. ☐ ☐

Give a reason why these numbers are divisible by five.

. . . . . .

5. Here are some fractions. Write each in its simplest form.

a) $\frac{5}{10}$ = ☐

b) $\frac{6}{9}$ = ☐

c) $\frac{10}{12}$ = ☐

d) $\frac{20}{25}$ = ☐

e) $\frac{27}{36}$ = ☐

f) $\frac{28}{63}$ = ☐

g) $\frac{56}{68}$ = ☐

h) $\frac{54}{81}$ = ☐

6. Here are some equivalent fractions. Fill in the missing numbers.

a) $\frac{1}{2} = \frac{\square}{10}$

b) $\frac{1}{3} = \frac{9}{\square}$

c) $\frac{3}{5} = \frac{12}{\square}$

d) $\frac{2}{7} = \frac{\square}{21}$

e) $\frac{4}{9} = \frac{\square}{36}$

f) $\frac{3}{4} = \frac{15}{\square}$

g) $\frac{7}{10} = \frac{56}{\square}$

h) $\frac{5}{8} = \frac{\square}{72}$

7. Fill in the missing fraction in each box. Write your final answer in its simplest form.

a) $\frac{2}{7} + \frac{3}{7} = \square$

b) $\frac{3}{5} + \frac{1}{5} = \square$

c) $\frac{7}{8} - \frac{1}{4} = \square$

d) $\frac{9}{10} - \frac{2}{5} = \square$

e) $\frac{2}{3} + \frac{2}{9} = \square$

f) $\frac{5}{6} - \frac{2}{3} = \square$

g) $\frac{2}{5} + \frac{4}{15} = \square$

h) $\frac{7}{12} - \frac{1}{4} = \square$

8. Write the following decimals as fractions.

Make sure you write the fractions in their simplest form.

a) 0.5 = ☐

b) 0.6 = ☐

c) 0.25 = ☐

d) 0.75 = ☐

e) 0.15 = ☐

f) 0.35 = ☐

g) 0.36 = ☐

h) 0.16 = ☐

9. Here are some decimals. Write them in order, starting with the smallest.

a) 0.4 0.04 0.44 0.004

☐ ☐ ☐ ☐

b) 0.06 0.5 0.51 0.007

☐ ☐ ☐ ☐

c) 0.1 0.03 0.2 0.008

☐ ☐ ☐ ☐

d) 0.33 0.3 0.03 0.4

☐ ☐ ☐ ☐

10. Write the following decimals as percentages.

a) 0.2 = ☐

b) 0.35 = ☐

c) 0.48 = ☐

d) 0.7 = ☐

e) 0.08 = ☐

f) 0.3 = ☐

g) 0.62 = ☐

h) 0.9 = ☐

11. Write the following percentages as decimals.

a) 40% = ☐

b) 50% = ☐

c) 71% = ☐

d) 75% = ☐

e) 60% = ☐

f) 30% = ☐

g) 10% = ☐

h) 11% = ☐

12. Write the following fractions as decimals in their simplest form.

a) $\frac{2}{5}$ = ☐

b) $\frac{3}{10}$ = ☐

c) $\frac{1}{2}$ = ☐

d) $\frac{3}{4}$ = ☐

e) $\frac{1}{4}$ = ☐

f) $\frac{4}{5}$ = ☐

g) $\frac{7}{10}$ = ☐

h) $\frac{11}{50}$ = ☐

i) $\frac{3}{20}$ = ☐

j) $\frac{9}{25}$ = ☐

13. Write the following percentages as fractions.

a) 40% = ☐

b) 50% = ☐

c) 71% = ☐

d) 75% = ☐

e) 60% = ☐

f) 30% = ☐

g) 10% = ☐

h) 11% = ☐

EXTRA PRACTICE QUESTIONS

14. Write the following fractions as percentages:

a) $\frac{1}{2}$ = ☐

b) $\frac{1}{4}$ = ☐

c) $\frac{3}{4}$ = ☐

d) $\frac{1}{5}$ = ☐

e) $\frac{3}{5}$ = ☐

f) $\frac{3}{10}$ = ☐

g) $\frac{3}{20}$ = ☐

h) $\frac{11}{25}$ = ☐

15. Find:

a) 20% of 60 = ☐

b) 30% of 80 = ☐

c) 50% of 12 = ☐

d) 25% of 16 = ☐

e) 75% of 36 = ☐

f) 40% of 35 = ☐

g) 80% of 70 = ☐

h) 90% of 10 = ☐

16. Calculate the following:

a) $\frac{2}{5}$ of 20 = ☐

b) $\frac{1}{2}$ of 70 = ☐

c) $\frac{3}{4}$ of 28 = ☐

d) $\frac{7}{9}$ of 18 = ☐

e) $\frac{3}{7}$ of 56 = ☐

f) $\frac{8}{9}$ of 81 = ☐

g) $\frac{5}{6}$ of 48 = ☐

h) $\frac{3}{8}$ of 40 = ☐

17. Simplify these ratios:

a) 3:12 = ☐ :

b) 8:4 = ☐ :

c) 30:35 = ☐ :

d) 24:36 = ☐ :

e) 16:18 = ☐ :

f) 20:12 = ☐ :

g) 56:49 = ☐ :

h) 72:81 = ☐ :

EXTRA PRACTICE QUESTIONS

18. Find the following fractions:

a) The ratio of boys to girls in a class is 4:5.
What fraction of the class are girls?

b) The ratio of red to blue balls in a bag is 2:3.
What fraction of the balls are blue?

c) The ratio of teachers to pupils in a village school are 2:7.
What fraction of the school are pupils?

d) The ratio of cars to vans in a car park is 5:2.
What fraction of the vehicles are vans?

19. Try the following ratio questions.

a) Divide 27 in the ratio 2:7. :

b) Divide 20 in the ratio 2:3. :

c) Divide 48 in the ratio 5:3. :

d) There are 35 students in a class. The ratio of boys to girls in the class is 4:3. How many girls are there?

e) To make chocolate covered cornflakes, the recipe uses 300g of chocolate to 200g of cornflakes. What is the ratio of chocolate to cornflakes? :

f) Mr Robinson takes the bus and train to work. The bus takes 10 minutes and the train takes 25 minutes. Write the ratio of the time spent on the bus to the time spent travelling by train in its simplest form. :

g) Orange squash is made by combining water with orange concentrate in the ratio 5:1. If 1200 millilitres of squash are made, how many millilitres of water are used?

h) On a school trip, for every six children there is one adult. If forty–two people go on the trip, how many are adults?

20. Fill in the missing numbers.

a) ☐ – 2 = 7

b) 5 + ☐ = 11

c) 7 – ☐ = 2

d) ☐ + 6 = 13

e) 16 – ☐ = 9

f) ☐ – 7 = 4

g) 8 – ☐ = 3

h) ☐ + 6 = 14

i) ☐ x 3 = 27

j) ☐ ÷ 2 = 10

k) 4 x ☐ = 20

l) ☐ ÷ 7 = 6

m) ☐ ÷ 8 = 3

n) 16 ÷ ☐ = 2

o) 36 ÷ ☐ = 4

p) 48 ÷ ☐ = 6

21. Here are some sequences. Find the next two numbers.

a) 3, 5, 7, 9, ☐, ☐

b) 4, 9, 14, 19, ☐, ☐

c) 6, 10, 14, 18, ☐, ☐

d) 21, 17, 13, 9, ☐, ☐

e) 1, 4, 9, 16, 25, ☐, ☐

f) 1, 3, 6, 10, ☐, ☐

22. a) In the sequence below, each term is found by multiplying the last term by 3 and then subtracting 2 from it. Find the next two terms in the sequence.

2, 4, 10, ☐, ☐

b) In the sequence below, each term is found by dividing the last term by 2 and then adding 4 to it. Find the missing terms in the sequence.

128, 68, 38, ☐, ☐

23. Two angles of a triangle are given below. Find the size of the third angle.

a) 30˚, 60˚, ☐˚

b) 28˚, 70˚, ☐˚

c) 44˚, 51˚, ☐˚

d) 62˚, 79˚, ☐˚

24. One angle of an isosceles triangle is given below.

Find the two possible pairs of values of the other two angles.

a) 40˚, ☐˚ and ☐˚ or ☐˚ and ☐˚

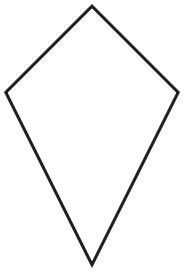
b) 68˚, ☐˚ and ☐˚ or ☐˚ and ☐˚

c) 16˚, ☐˚ and ☐˚ or ☐˚ and ☐˚

d) 28˚, ☐˚ and ☐˚ or ☐˚ and ☐˚

25. Here are some shapes. Write down the number of lines of reflection and the order of rotational symmetry for each shape.

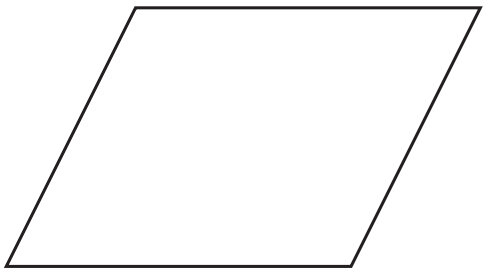
a)



lines of reflection ☐

order of rotational symmetry ☐

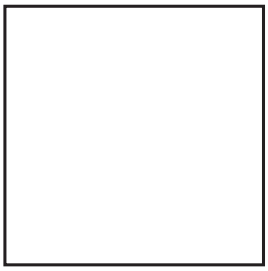
b)



lines of reflection ☐

order of rotational symmetry ☐

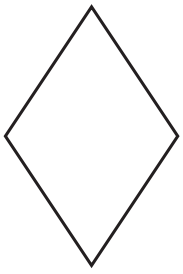
c)



lines of reflection ☐

order of rotational symmetry ☐

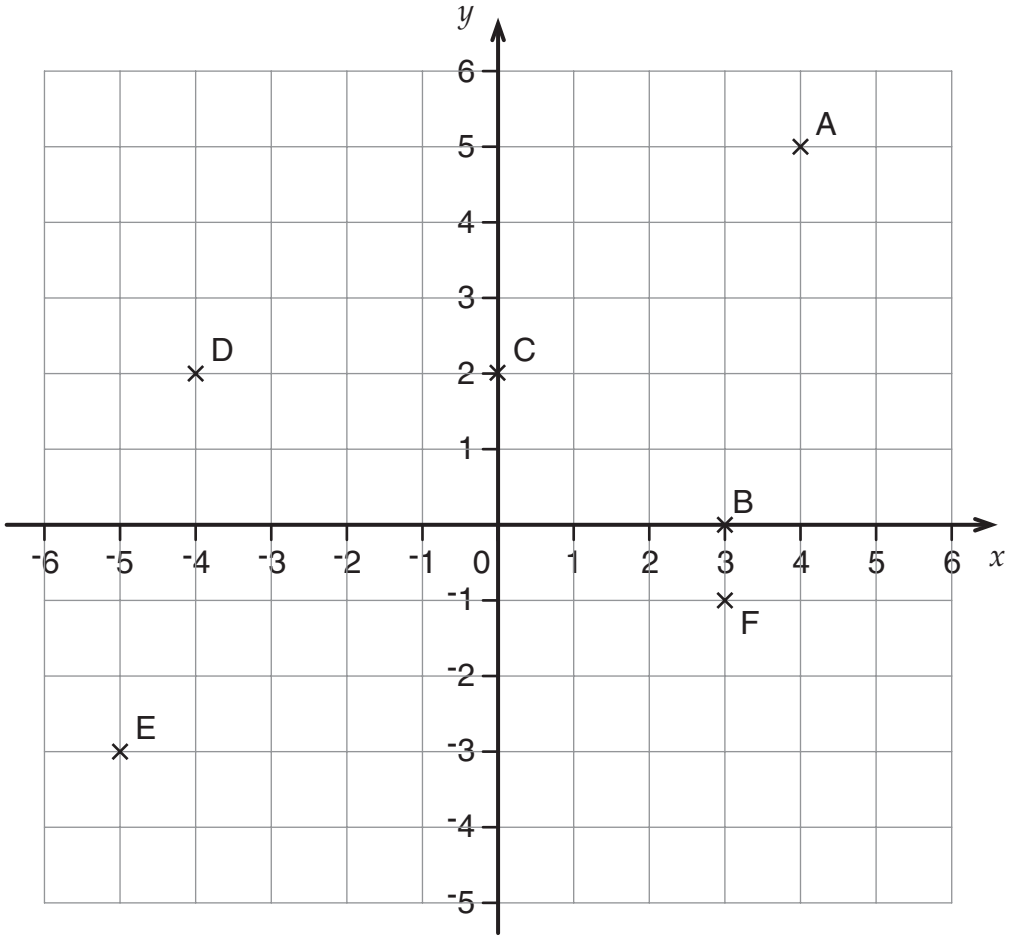
d)



lines of reflection ☐

order of rotational symmetry ☐

26. Write down the coordinates of the points:



a) A ☐

b) B ☐

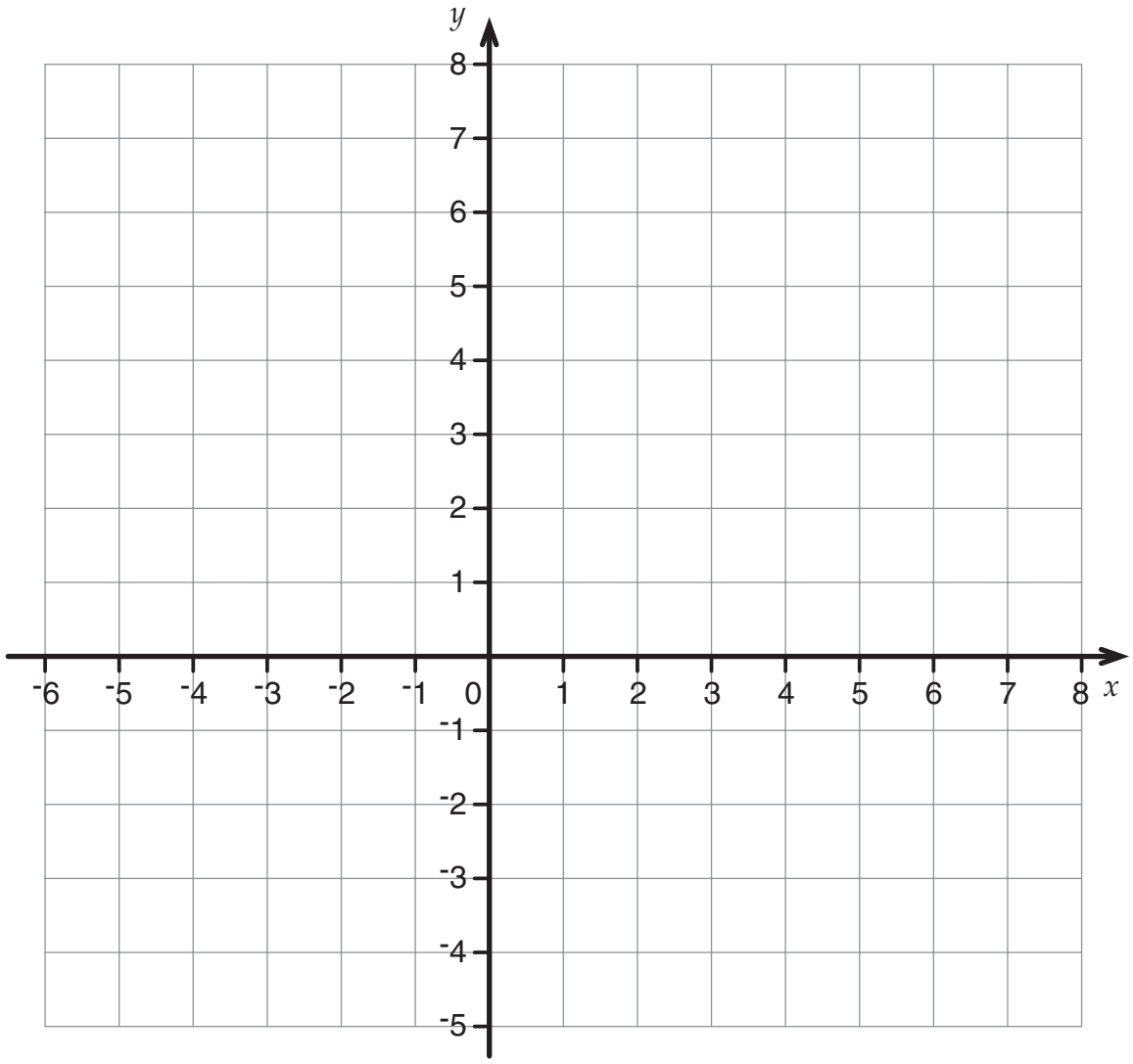
c) C ☐

d) D ☐

e) E ☐

f) F ☐

27. Plot on the grid below the following points. Label them with the given letter.



a) A (1, 4)

b) B (5, 0)

c) C (0, 7)

d) D (5, 3)

e) E ($^{-}$3, 4)

f) F (6, $^{-}$2)

g) G ($^{-}$4, $^{-}$3)

h) H (0, $^{-}$3)

28. Fill in the numbers in the spaces below:

a) 3 x 1000 = ☐

b) 4 x 100 = ☐

c) 6 x 10 = ☐

d) 5.01 x 1000 = ☐

e) 6.2 x 10 = ☐

f) 1.79 x 100 = ☐

g) 10.63 x 10 = ☐

h) 0.134 x 100 = ☐

i) 1000 ÷ 100 = ☐

j) 6340 ÷ 100 = ☐

k) 4200 ÷ 1000 = ☐

l) 12.6 ÷ 100 = ☐

m) 76.8 ÷ 1000 = ☐

n) 12 ÷ 1000 = ☐

o) 0.12 ÷ 10 = ☐

p) 0.06 ÷ 100 = ☐

29. Convert each of the following measures into the units shown.

a) 1 metre = ☐ centimetres = ☐ millimetres

b) 2 kilograms = ☐ grams

c) 4.1 kilometres = ☐ metres = ☐ centimetres

d) 0.5 litres = ☐ millimetres

e) 700 millilitres = ☐ litres = ☐ cl

f) 3500 grams = ☐ kg

g) 75cl = ☐ ml = ☐ litres

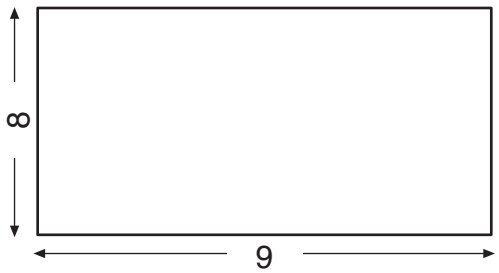
h) 6500 centimetres = ☐ m = ☐ mm

i) 90cm = ☐ m

j) 20g = ☐ kg

30. Find the area and perimeter of the shapes below (all measurements are given in centimetres):

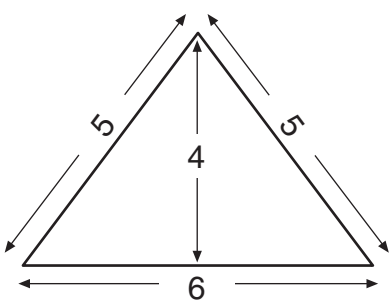
a)



Area = ☐

Perimeter = ☐

b)



Area = ☐

Perimeter = ☐

31. Find the mean, median and mode of the sets of numbers below:

a) 3, 3, 3, 4, 5, 6, 7, 8, 10, 12

mean ☐ median ☐ mode ☐

b) 7, 6, 2, 6, 4

mean ☐ median ☐ mode ☐

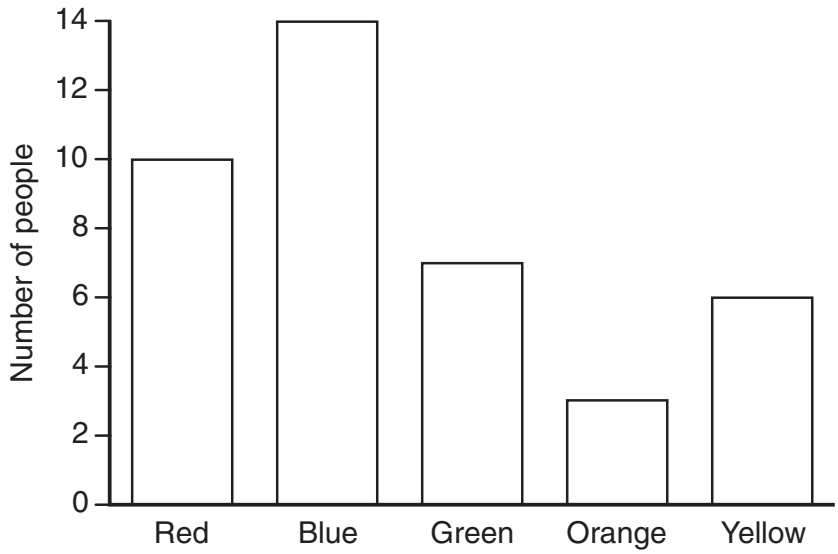
c) 11, 4, 4, 7, 3, 9, 8, 2

mean ☐ median ☐ mode ☐

d) 9, 6, 3, 9, 8, 7, 6, 9, 1, 4

mean ☐ median ☐ mode ☐

32. In a survey, people were asked to name their favourite colour. The results of the survey are shown in the bar chart.

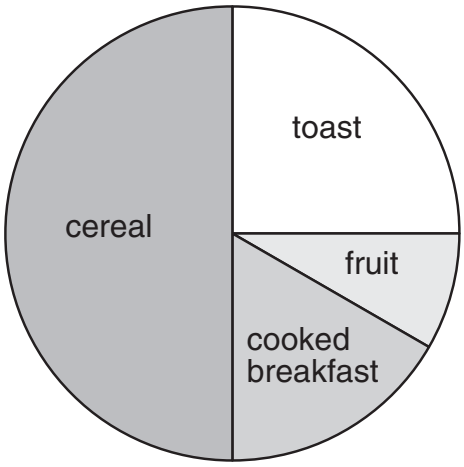


a) How many people took part in the survey? ☐

b) What was the most popular colour? ☐

c) Which colour was named as their favourite by three people? ☐

33. The pie chart below shows the results of a survey of 24 people to find out what they ate for breakfast that morning.



a) How many people ate cereal? ☐

b) How many people had toast? ☐

c) The angle of the sector for people having a cooked breakfast is 60˚.

i) What fraction of the people had cooked breakfast? ☐

ii) How many people had cooked breakfast? ☐

34. A day of the week is picked at random. What is the probability that the word:

a) begins with a ‘t’? ☐ b) ends with a ‘y’? ☐

c) ends with a ‘u’? ☐

35. A month of the year is picked at random. What is the probability that it:

a) begins with an ‘m’? ☐

b) ends with an ‘y’? ☐

36. An old saying states that oysters should only be eaten in a month with an 'r' in it.

A month is picked at random.

What is the probability that oysters should be eaten in the month? ☐

37. A fair dice is thrown. What is the probability that it:

a) shows an even number? ☐

b) shows a number more than four? ☐

c) shows a number less than seven? ☐

d) shows a number more than eight? ☐

e) shows a prime number? ☐

38. A bag contains three red, four blue and five green balls. A ball is picked at random.

What is the probability that this ball is:

a) red? ☐

b) blue? ☐

c) yellow? ☐

Problem solving (a)

Ma2

1. In a group of sheep and ducks, the number of legs is 20 more than twice the number of heads. How many sheep are there?

2. A farmer has 50 hens and cows. If these animals have 160 legs altogether, how many more cows does he have than hens?

3. A container which is full of water weighs 3.2kg. An identical container which is half full weighs 2.3 kg. How much does the container weigh when it is empty?

4. Danny had 20 squares of chocolate. He gave half of them to Joe and half of what was left to Harry. What percentage of the original 20 squares did he give away?

5. Amber, Bella and Caroline each have some money. Bella has twice as much as Amber, and Caroline has three times as much as Amber. If they have £42 altogether, how much does each have?

6. Tom is twice as old as Frank and Leo is twice as old as Tom. If the sum of their ages is 35 years, how much older than Frank is Leo?

7. In a group of 45 children there are 3 girls for every 2 boys. How many boys are there? What percentage of the group are girls?

8. Using the digits 7, 9 and 2 once each, take the smallest 3 digit number that you can make from the largest, and divide the answer by 9.

9. A train usually leaves the station at 9.05. George leaves home 10 minutes before this in order to catch it. One day he was delayed in leaving home by 5 minutes, but had to wait 20 minutes at the station. How late was the train in leaving the station?

10. 5 pens and 3 crayons cost £3.10 and 4 pens and 6 crayons cost £3.20.
    Find the cost of:
    a) 9 pens and 9 crayons
    b) 3 pens and 3 crayons
    c) 2 pens
    d) 1 pen
    e) 1 crayon

Problem solving (b)

Ma3

1. Through how many degrees does the hour hand of a clock turn between 8.00am and 10.30am.

2. The area of a square is 81cm^2. What is its perimeter?

3. Each side of a square is 6cm. A rectangle has the same area as the square but a length of 9cm. Find its perimeter.

4. A box in the shape of a cuboid has sides of 1m, 60cm and 80cm. What is the largest number of smaller cuboids of sides 15cm, 20cm and 16cm that would fit into the box?

5. One angle of an isosceles triangle is 72°. What size could the other two angles be?

Ma4

1. In a year when the 1st October is a Tuesday, a school trip is planned. If the trip could take place on any day of the week, what is the probability that it will be on an odd numbered Thursday in October?

2. After five matches, the mean number of goals scored by a school team each match was 3. After the seventh match the mean was 5. Find the mean number of goals scored in the final two matches.

3. After taking several tests, the range of David's marks was 4 and his lowest mark was 20. The range of Sarah's marks was 6 and her highest mark was three quarters of David's highest mark. What was Sarah's lowest mark?

4. In a bag there are 12 red balls, 3 green balls and 5 yellow balls. Jack takes out a ball without looking at the colour and says, "The probability of taking a ball of this colour is 0.25." What colour did he pick?

5. 48 children are asked about their favourite pets and their answers are recorded on a pie chart. 30° represents the children who prefer hamsters and 90° the children whose favourite pets are cats. Half the remaining children chose rabbits and 2 children chose mice. Everyone else preferred horses. What fraction of the original group preferred horses?

Record sheet

Pupil's name: . . . . . **Class:** . . . . . .

Tick the box when the pupil has attained the target.

Ma2 Number and algebra

Levels 1 and 2

- ☐ Count sets of objects.
- ☐ Use and know the place value of digits.
- ☐ Order numbers up to 100.
- ☐ Know when to use addition and subtraction in word problems.
- ☐ Understand that subtraction is the inverse of addition.
- ☐ Solve number problems using mental calculation (including use of money and measures).
- ☐ Recognise sequences of numbers, including odd and even.

Level 3

- ☐ Understand place value up to 1000.
- ☐ Approximate numbers up to 1000.
- ☐ Use decimal notation.
- ☐ Recognise negative numbers, including temperatures.
- ☐ Add and subtract two numbers with two digits mentally.
- ☐ Add and subtract numbers with three digits using a written method.
- ☐ Recall the 2, 3, 4, 5 and 10 multiplication tables, and know the associated division.
- ☐ Solve whole number problems involving multiplication or division, including those that have remainders.
- ☐ Use simple fractions as several parts of a whole.
- ☐ Know when two fractions are equivalent.

Level 4

- ☐ Know how to multiply and divide whole numbers by 10 and 100.
- ☐ Compute using the four operations mentally.
- ☐ Round to the nearest 10.
- ☐ Know all the multiplication tables up to 10 and the associated division.
- ☐ Use written methods of addition and subtraction.
- ☐ Know short multiplication and division.
- ☐ Add and subtract decimals to two places.
- ☐ Order decimals to three places.
- ☐ Be able to check whether answer is reasonable.
- ☐ Recognise approximate proportions of a whole and use simple fractions and percentages to describe them.
- ☐ Recognise and describe number patterns, including factor, multiple and square.
- ☐ Start to use simple formulae expressed in words.
- ☐ Use coordinates in the first quadrant.

Level 5

- ☐ Know how to multiply and divide whole numbers and decimals by 10, 100 and 1000.
- ☐ Order, add and subtract negative numbers, including problems in context.
- ☐ Use all four operations with decimals to two places.
- ☐ Reduce a fraction to its simplest form by cancelling.
- ☐ Solve simple problems involving ratio.
- ☐ Solve simple problems involving direct proportion.
- ☐ Calculate fractional or percentage parts of quantities and measurements.
- ☐ Solve problems with fractions or percentages using a calculator.
- ☐ Multiply and divide a three-digit number by a two-digit number without a calculator.
- ☐ Check solutions by applying inverse operations or estimate using approximations.
- ☐ Construct and use simple formulae involving one or two operations.
- ☐ Use brackets appropriately.
- ☐ Use and interpret coordinates in all four quadrants

Record sheet

Ma3 Shape, space and measures

Levels 1 and 2

- ☐ Measure and order objects by comparing.
- ☐ Use mathematical names and describe properties for common 2D and 3D shapes.
- ☐ Distinguish between straight and turning movements, and recognise a right angle as a measure of turn.
- ☐ Begin to use common non-standard and standard units to measure length and mass.
- ☐ Recognise a right angle.

Level 3

- ☐ Classify 2D and 3D shapes using mathematical properties.
- ☐ Use non-standard and standard metric units of length, mass and capacity, and standard units of time.

Level 4

- ☐ Make 3D mathematical models from nets.
- ☐ Draw common 2D shapes on grids.
- ☐ Reflect shapes in a mirror line.
- ☐ Choose and use appropriate units and instruments.
- ☐ Find perimeters of simple shapes.
- ☐ Find areas by counting squares.
- ☐ Find volumes of cubes and cuboids.
- ☐ Measure time using am and pm or twenty-four hour clock.

Level 5

- ☐ Measure and draw angles.
- ☐ Identify acute, obtuse and reflex angles.
- ☐ Know the sum of angles of a triangle.
- ☐ Identify types of triangle.
- ☐ Know the sum of angles at a point.
- ☐ Identify all symmetries of 2D shapes.
- ☐ Know the approximate metric equivalents of common imperial units.
- ☐ Convert one metric unit to another.
- ☐ Make estimates using a range of measures.
- ☐ Know and use the formula for the area of a rectangle.

Ma4 Handling data

Levels 1 and 2

- ☐ Sort and classify objects using one or more criteria.
- ☐ Record results in lists, tables or bar graphs after gathering information.

Level 3

- ☐ Extract and interpret information presented in simple lists and tables.
- ☐ Construct bar graphs and pictograms.
- ☐ Interpret data that has been presented in a bar chart or pictogram.

Level 4

- ☐ Collect discrete data and record results using a frequency table.
- ☐ Know and use the mode and range to describe a set of data.
- ☐ Group data in equal class intervals, where appropriate, and represent the data in frequency diagrams.
- ☐ Interpret and represent collected data in frequency diagrams.
- ☐ Construct and interpret simple line graphs.

Level 5

- ☐ Understand and calculate the mean, median, mode or range of data.
- ☐ Compare two distributions, using the range and one of the mean, median and mode.
- ☐ Interpret graphs and diagrams (including pie charts).
- ☐ Understand and use the probability scale from 0 to 1.
- ☐ Find probabilities using methods based on equally likely outcomes and experimental evidence.
- ☐ Understand that different outcomes may arise from repeating an experiment.

Skills checklist / Record sheet

Pupil's name . . . . . .

Class . . . . . .

Teacher . . . . . .

Ma2

Levels 1 and 2

I can:

- ☐ count, add and subtract to 10.
- ☐ understand place value to 100.
- ☐ recognise number patterns including odd and even numbers.

Level 3

I can:

- ☐ understand place value in numbers up to 1000 and approximate.
- ☐ add and subtract to 20 in my head.
- ☐ add and subtract three digits on paper.
- ☐ multiply and divide by 2, 3, 4, 5, 10 in my head.
- ☐ solve whole number problems including those with remainders.
- ☐ use simple fractions.
- ☐ recognise equivalent fractions.
- ☐ recognise negative numbers.

Level 4

I can:

- ☐ multiply and divide whole numbers by 10 or 100.
- ☐ multiply and divide using my tables up to 10 x 10.
- ☐ round a number to the nearest 10.
- ☐ add and subtract decimals to 2 places.
- ☐ use a calculator where appropriate.
- ☐ put decimals in order of size up to 3 decimal places.
- ☐ use simple fractions and percentages.
- ☐ use words to describe formulae.
- ☐ use coordinates in the first quadrant.

Skills checklist / Record sheet

Pupil's name . . . . . .

Level 5

I can:

- ☐ understand and use the mean of discrete data.
- ☐ calculate the mean, median, mode or range of data.
- ☐ compare two distributions using the mean, median, mode or range.
- ☐ interpret diagrams, including pie charts.
- ☐ understand and use the probability scale from 0 to 1.
- ☐ select and use methods based on equally likely outcomes and experimental evidence as appropriate.
- ☐ understand that different outcomes may arise from repeating an experiment.

Date	More help needed	Outcome

Skills checklist / Record sheet

Pupil's name . . . . . .

Ma3

Levels 1 and 2

I can:

- ☐ use mathematical names for common 2D and 3D shapes.
- ☐ recognise a right angle.

Level 3

I can:

- ☐ use cm and km.
- ☐ use ml and l.
- ☐ use g, kg and metric tonnes.
- ☐ tell the time and work out calculations involving time.

Level 4

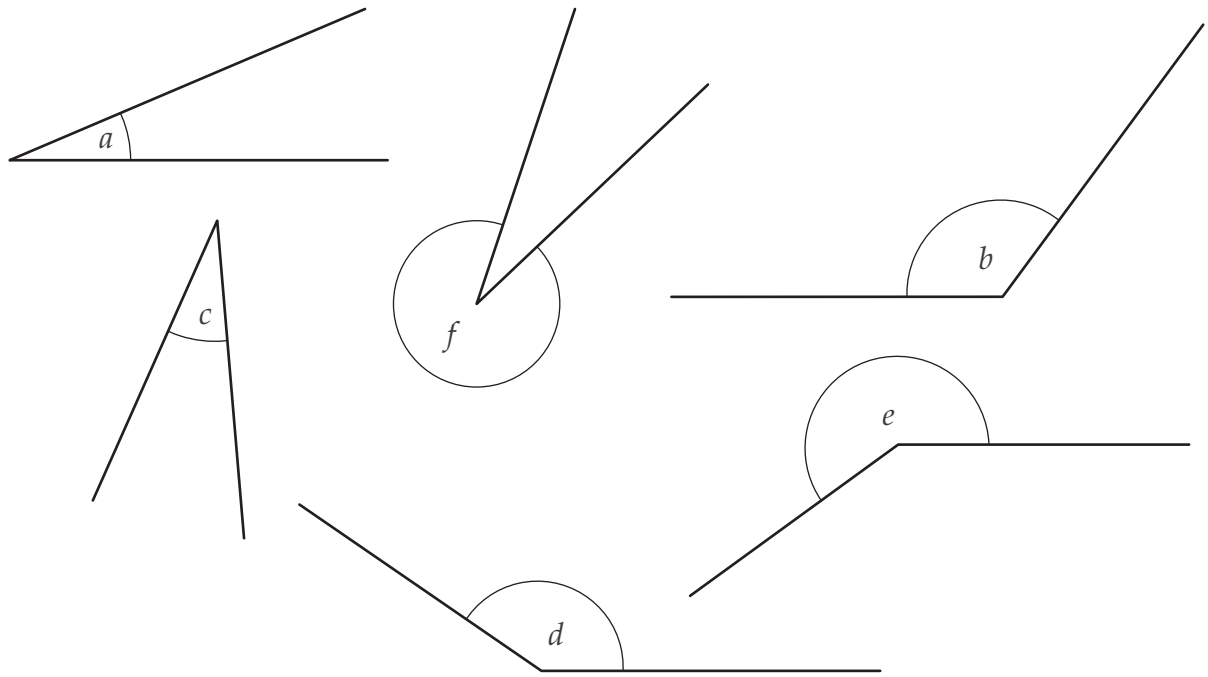
I can:

- ☐ make 3D models by linking faces or edges.
- ☐ draw 2D shapes on grids.
- ☐ reflect shapes using a mirror line.
- ☐ find perimeters of shapes.
- ☐ find areas by counting squares.
- ☐ find the volume of cubes and cuboids.
- ☐ measure time using am and pm or the twenty-four hour clock.

Useful words (a)

The following terms frequently appear on test papers. Here each is explained for you and there is a practice question to check that you have understood it.

Angles:
Acute angle: an angle that is less than 90 degrees.
Obtuse angle: a number that is bigger than 90 degrees but smaller than 180 degrees.
Reflex angle: an angle that is larger than 180 degrees but smaller than 360 degrees.



Angles _____ and _____ are acute angles.

Angles _____ and _____ are obtuse angles.

Angle _____ and angle _____ are reflex angles.

Averages:
The mean: add all the values together and divide by the number of values that you have.

The mean of 3, 8, 12, 5 and 2 is _____ .

The median: arrange all the values in order of size and pick the middle value.

The median value of 3, 8, 12, 5 and 2 is _____ .

If you have an even number of values, the median is halfway between the middle two values when placed in order of size.

The median value of 6, 4, 9, 8, 12 and 14 is _____ .

The mode: the most frequently occurring value.

The mode of 20, 15, 18, 23 and 20 is _____ .

Useful words (b)

Others:

Convert: change something from one form to another.

Convert $\frac{1}{2}$ to a decimal. _____ .

Denominator: the bottom number of a fraction.

The denominator of $\frac{1}{4}$ is _____ .

Equivalent fractions: two or more fractions which are equal in value.

Draw lines joining up the equivalent fractions.

$\frac{3}{4}$ $\frac{5}{10}$

$\frac{1}{2}$ $\frac{2}{3}$

$\frac{6}{9}$ $\frac{9}{16}$

Factor: a whole number which divides into another number without leaving a remainder.

The factors of 30 are _____ . (Remember that 1 and 30 are factors of 30.)

Highest common factor: the largest number which will divide into two or more numbers without leaving a remainder.

The highest common factor of 8 and 12 is _____ .

Lowest common multiple: the smallest number into which two or more numbers will divide without leaving a remainder. This is also the lowest common denominator of two or more fractions.

The lowest common multiple of 2, 3, 4 and 8 is _____ .

EXTRA PRACTICE QUESTIONS

1. Find the value of the following:

a) $6 - 4 =$ ☐

b) $^{-}8 + 3 =$ ☐

c) $2 - 10 =$ ☐

d) $^{-}5 - 2 =$ ☐

e) $^{-}6 + 6 =$ ☐

f) $2 - {}^{-}1 =$ ☐

g) $3 + {}^{-}5 =$ ☐

h) $^{-}2 - 3 =$ ☐

2. a) Round 247 to the nearest 10. ☐

b) Round 35 142 to the nearest 100. ☐

c) Round 24 589 to the nearest 1000. ☐

d) Round 61 445 to the nearest 100. ☐

3. Look at the set of numbers:

1 2 4 10 20 27 29

a) Write down two prime numbers. ☐ ☐

b) Write down two square numbers. ☐ ☐

c) Write down two multiples of five. ☐ ☐

d) Write down two factors of fifty. ☐ ☐

4. Look at the set of numbers:

113 128 130 222 225 248

a) Write down two numbers that are divisible by two. ☐ ☐

Give a reason why these numbers are divisible by two.

. . . . . .

b) Write down two numbers that are divisible by three. ☐ ☐

Give a reason why these numbers are divisible by three.

. . . . . .

c) Write down two numbers that are divisible by four. ☐ ☐

Give a reason why these numbers are divisible by four.

. . . . . .

d) Write down two numbers that are divisible by five. ☐ ☐

Give a reason why these numbers are divisible by five.

. . . . . .

5. Here are some fractions. Write each in its simplest form.

a) $\frac{5}{10}$ = ☐

b) $\frac{6}{9}$ = ☐

c) $\frac{10}{12}$ = ☐

d) $\frac{20}{25}$ = ☐

e) $\frac{27}{36}$ = ☐

f) $\frac{28}{63}$ = ☐

g) $\frac{56}{68}$ = ☐

h) $\frac{54}{81}$ = ☐

6. Here are some equivalent fractions. Fill in the missing numbers.

a) $\frac{1}{2} = \frac{\square}{10}$

b) $\frac{1}{3} = \frac{9}{\square}$

c) $\frac{3}{5} = \frac{12}{\square}$

d) $\frac{2}{7} = \frac{\square}{21}$

e) $\frac{4}{9} = \frac{\square}{36}$

f) $\frac{3}{4} = \frac{15}{\square}$

g) $\frac{7}{10} = \frac{56}{\square}$

h) $\frac{5}{8} = \frac{\square}{72}$

7. Fill in the missing fraction in each box. Write your final answer in its simplest form.

a) $\frac{2}{7} + \frac{3}{7} = \square$

b) $\frac{3}{5} + \frac{1}{5} = \square$

c) $\frac{7}{8} - \frac{1}{4} = \square$

d) $\frac{9}{10} - \frac{2}{5} = \square$

e) $\frac{2}{3} + \frac{2}{9} = \square$

f) $\frac{5}{6} - \frac{2}{3} = \square$

g) $\frac{2}{5} + \frac{4}{15} = \square$

h) $\frac{7}{12} - \frac{1}{4} = \square$