

# Year 6 Maths Activities

# Think Academy Home Learning Study Pack

## Practice Questions and Answers





# Contents

**Geometry.....2**

**Area.....7**

**Money.....12**

**Proportion.....14**

**Statistics & Probability.....18**

**Patterns & Sequences.....21**

**Fractions.....24**

**Date & Time.....27**

**Word Problems 1.....31**

**Word Problems 2.....33**

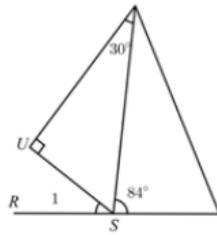
**Solutions.....36**

# Geometry

1.

Find the angles.

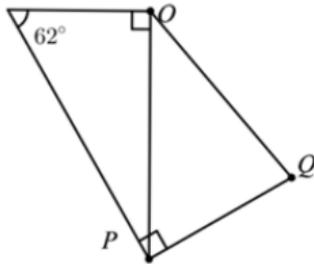
(1)  $\angle RSU = \underline{\hspace{2cm}}$  .




---

2.

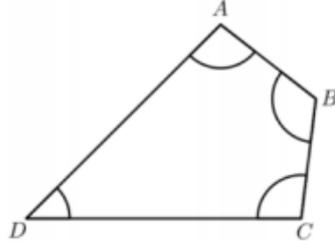
(2)  $\angle OPQ = \underline{\hspace{2cm}}$  .




---

3.

In the quadrilateral  $ABCD$ ,  $\angle A = \angle C$ ,  $\angle D = 45^\circ$ ,  $\angle B = 121^\circ$

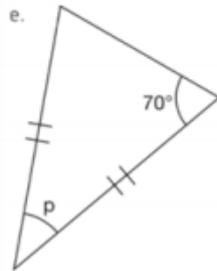


Find angle A.

---

4.

This is an isosceles triangle. ( From Queen Elizabeth's School )



What is the size of the angle labelled  $p$ ?

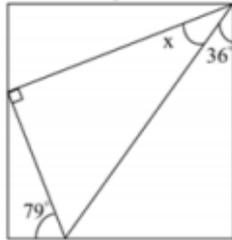
- A.  $30^\circ$       B.  $40^\circ$       C.  $55^\circ$       D.  $70^\circ$       E.  $110^\circ$

Mark only one oval.

- A
- B
- C
- D
- E

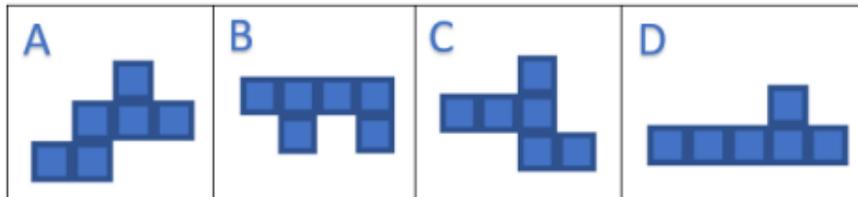
5.

Here is a right angled triangle inside a rectangle. Calculate the value of angle  $x$ . Do not use a protractor or angle measurer, the diagram is not to scale. ( From Trinity School )



6.

Which of the following nets make cubes? (Select all which apply!)

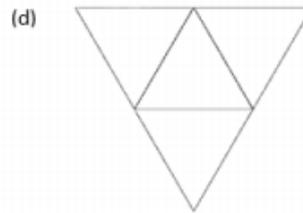
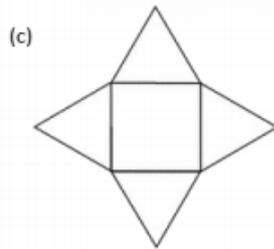
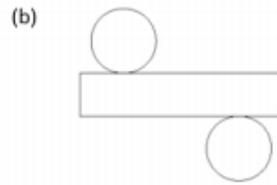


*Tick all that apply.*

- A
- B
- C
- D

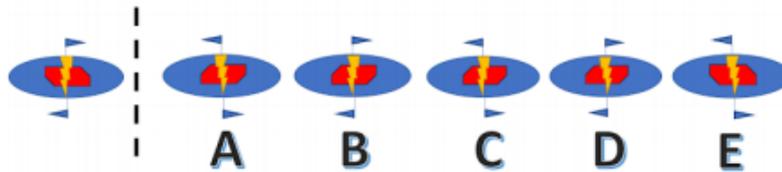
7.

Name the 3D shapes that can be made from these nets:



Transformations!

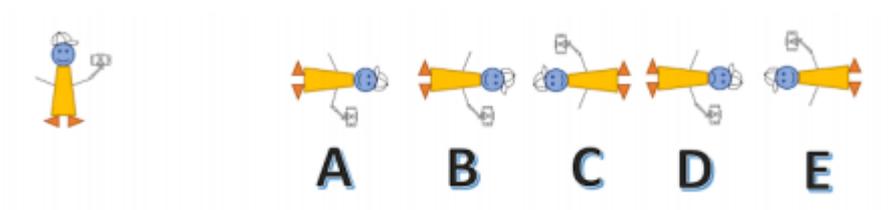
8. Which of the following options shows the correct reflection of the shape on the right in the dotted line?



Mark only one oval.

- A
- B
- C
- D
- E

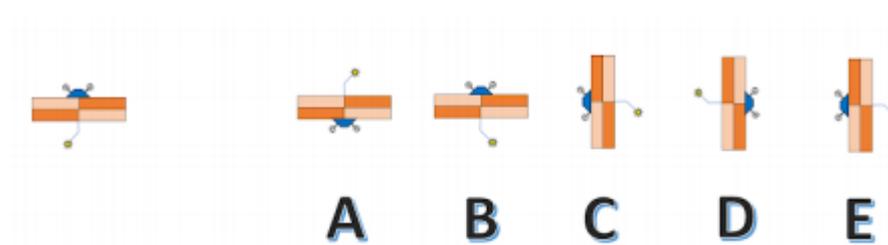
9. Which of the following options shows the shape on the left rotated by 90 degrees clockwise?



Mark only one oval.

- A  
 B  
 C  
 D  
 E

10. Which of the following options shows the shape on the left rotated by 90 degrees anticlockwise?



Mark only one oval.

- A  
 B  
 C  
 D  
 E

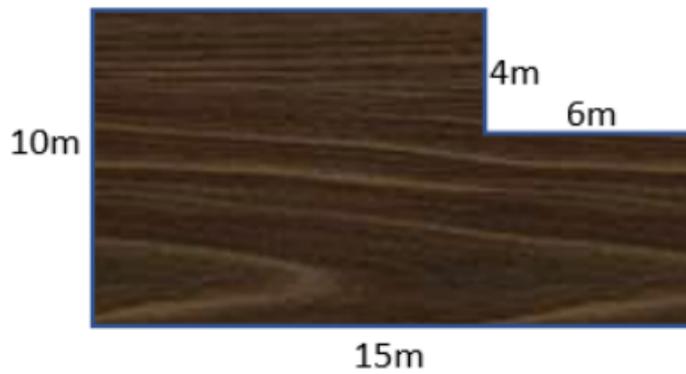
## Area

1. A rectangle has length 4.2cm and width 1.7cm. Find its area.

---

- 2.

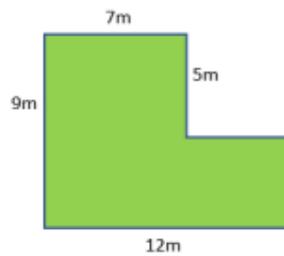
Find the area of this piece of wood:



---

3.

Mr Bottomley is landscaping his garden, the shape of which is shown below. Find the area of his garden.




---

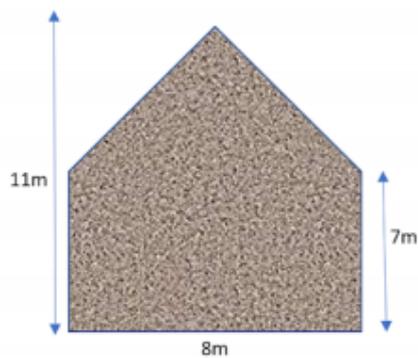
4.

Adrian's Garden measures 10m by 6m.  
Paving stones measure 0.5m by 0.5m.  
How many paving stones does Adrian need to buy to pave his whole garden?

---

5.

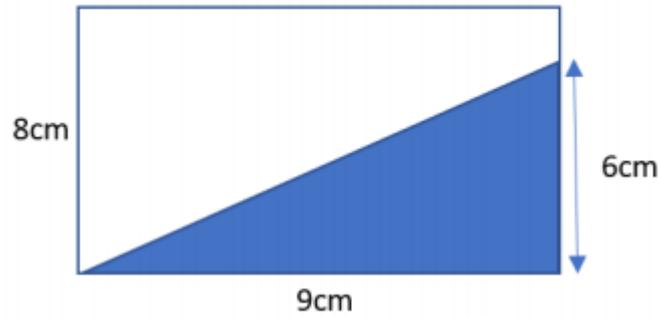
The diagram below shows the cross-section of Dominic's house. Find the total area of the cross section.




---

6.

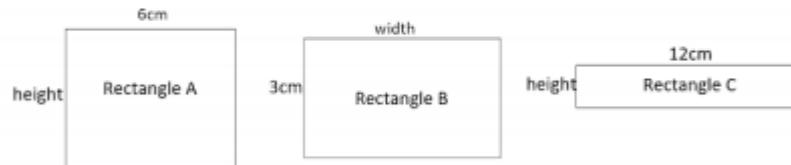
Find the area of the unshaded region:




---

7.

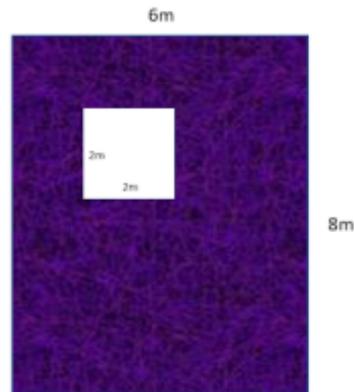
The following rectangles all have an area of  $24\text{cm}^2$ . Find the missing lengths and widths.




---

8.

Calculate the size of the area left when a square side length 2 metres is removed from the rectangle below:

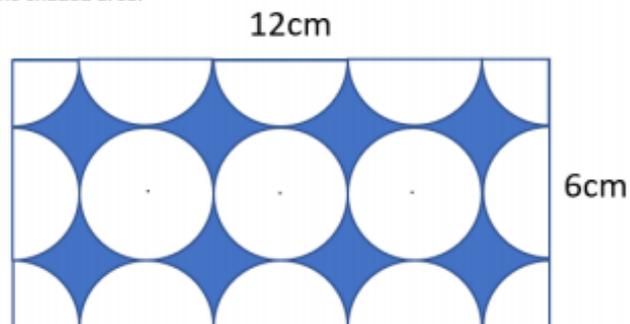



---

9.

The diagram below shows a rectangle, 12cm long, 6cm wide and with parts of non-overlapping circles drawn all over it. The circles all have the same radius and the area of each is  $7\text{cm}^2$ .

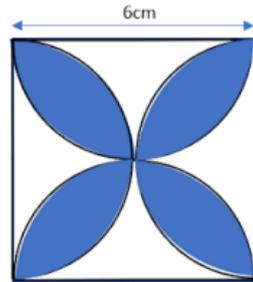
Work out the shaded area.




---

10.

The diagram below shows a square which is 6cm long with 4 identical semi-circles drawn on each edge. These semi-circles overlap to create four petals which are shaded on the diagram. The area of each semi-circle is  $14\text{cm}^2$ . Find the shaded area.




---

## Money

1.

Calculate the following:

(i)  $£4.56 \div 3$

(ii)  $£2.15 \times 6$

---

2. Chocolate bars cost 34p. How many can Brian buy with a £5 note?

---

3. Jacob goes to buy some stationery. He buys 3 notepads which cost £1.59 each and a packet of pens which costs £4.29. If Jacob pays with a £10 note, how much change will he receive?

---

4. Richard is buying some books at a car boot sale. If he spends £10.40 and gets 8 books, how much did each book cost?

---

5.

I can convert £5 to get 6 euros.

I can convert £3 to get 4 dollars.

How many euros would I get for £100?

---

6. How many dollars would I get for 90 euros?

---

7. Julian goes to the greengrocer to buy some fruit for the school picnic. Apples cost 28p each, bananas cost 31p each and oranges cost 36p each. Julian decides he should buy only one kind of fruit for everyone so that nobody gets jealous of anyone else. If Julian spends £11.20, which kind of fruit did he buy?

---

8. Mr Parker goes to the same greengrocer and buys equal numbers of apples, bananas and oranges. If he spends £19 in total, how many pieces of fruit did he buy?

---

9. Michael goes to get his book printed. The shop he goes to charges £2.60 for the binding and 3p per page. How much does Michael spend if his book is 210 pages long?

---

10. Jeremy goes to the same shop and spends £7.10 getting his book printed. How many pages shorter was Jeremy's book than Michael's book?

---

## Proportion

1.

Here is a list of ingredients to make 12 banana muffins:

5 bananas
110g butter
225g sugar
50g flour
120g chocolate

Natalie would like to make 48 banana muffins. How much butter should she use?

---

2.

Sally wants to make some banana muffins using the recipe from question 1. She has 150g of flour, 300g of chocolate and plenty of all the other ingredients. She makes as many muffins as she can with the ingredients she has.

- (i) After making the muffins, does she have unused flour or unused chocolate?
- (ii) How much of this ingredient does she have left?

---

3.

A recipe for a pudding for 6 people is as follows:

3 eggs
150g flour
21 cherries
90g sugar
45g butter

If Sadie wants to make enough pudding for 8 people, how much of each ingredient would she need?

---

4.

A recipe for 12 cakes needs 200g of flour.

Isaac has 250g of flour.

How many cakes could he make?

---

5.

Jonathan is making a drink. He mixes 1 part cordial with 5 parts water. If he uses 1L of water, how much cordial does he use? Give your answer in ml.

---

6.

Carrie is making a VAT of milky coffee for a meeting. She mixes 1 part milk with 4 parts coffee. If she needs to make a total of 3L of milky coffee, how much milk does she need? Give your answer in ml.

---

7.

To cook a joint of lamb, you need to leave it in the oven for 30 minutes for every kilogram it weighs plus 20 minutes extra. Find how long you should cook a joint weighing:

- (a) 3kg
- (b) 4.5kg

---

8.

Which of the following events is most likely?

A: A fair coin is thrown and lands on heads

B: A fair six-sided die is thrown and lands on a factor of 6

C: A blue counter is selected at random from a bag containing 3 red counters and 4 blue counters

*Mark only one oval.*

- A
- B
- C

9.

You have a set of cards numbered 1-50 inclusive. On each number that is a factor of 100, you draw a smiley face. On each number that is a multiple of 4, you draw a hat. What is the probability of selecting a card that has both a smiley face and a hat drawn on it? Give your answer as a fraction in its simplest form.

---

10.

A bag contains coloured marbles of just two colours.

There are twenty-five green marbles numbered 1 to 25.

There are thirty-five blue marbles numbered 1 to 35.

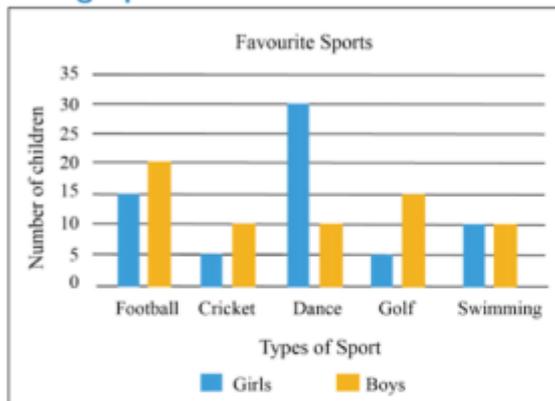
What is the probability, if I pick a marble at random from the bag, of picking a marble which is numbered with a multiple of 4?

---

## Statistics & Probability

1.

This graph shows the results from a survey taken in a school.



( 1 ) Which sport is the most popular ? \_\_\_\_\_

\_\_\_\_\_

2.

( 2 ) How many more girls participate in dance than boys? \_\_\_\_\_

\_\_\_\_\_

3. How many children took part in the survey? (Note each pupil only chose 1 favourite sport).

\_\_\_\_\_

4.

From which of the following names of states of the USA are you most likely to pick a vowel at random?

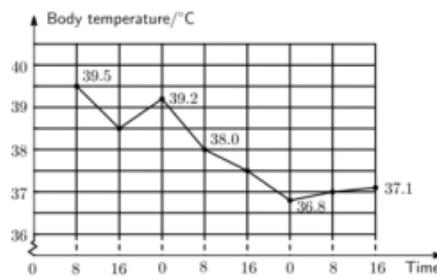
A. Louisiana B. Georgia C. California D. Oregon E. Mississippi

Mark only one oval.

- A  
 B  
 C  
 D  
 E

5.

The graph below shows a patient's body temperature recorded every 8 hours from 7<sup>th</sup> April to 9<sup>th</sup> April



- (i) The patient's highest recorded body temperature over the period was \_\_\_\_\_.  
 (ii) The patient's lowest recorded body temperature over the period was \_\_\_\_\_.

\_\_\_\_\_

6. What was the patient's body temperature at 16:00 on 8th April?

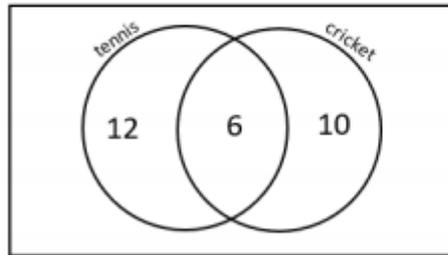
\_\_\_\_\_

7. Calculate the largest change in temperature between 2 consecutive readings across the 3 days.

\_\_\_\_\_

8.

A class of 36 children were asked which Summer sports they liked to play. The results are shown in the Venn diagram below:



- (i) How many children said they like tennis?
- (ii) How many children said they like both tennis and cricket?

---

9. How many children from the class said they didn't like either of the 2 sports?

---

10. I have a deck of 20 cards numbered from 1-20. If I take one at random, what is the probability I get a card with a prime number written on it?

---

## Patterns & Sequences

1. Find the next term in each of the following sequences:

4, 12, 20, 28, 36, ...

---

- 2.

1, 4, 9, 16, ...

---

- 3.

John makes a series of patterns using matchsticks as shown below. How many matchsticks will he need for pattern 6?



Pattern 1



Pattern 2



Pattern 3

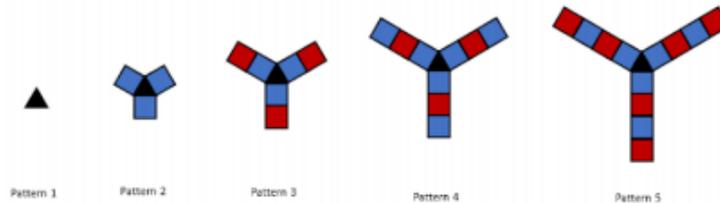
---

4. Which pattern number will he need 40 matchsticks to make?

---

5.

Bobby is making windmills as in the pattern below. He starts with a triangle for the centre and then adds coloured squares for the windmill blades.



How many red squares will Bobby need to construct pattern 10?

---

6. How many shapes (triangles and squares) will he need for pattern 30?

---

7. Simon wants to construct a windmill from Bobby's pattern. If he has a box containing a black triangle, 25 red squares and 30 blue squares, what is the pattern number of the largest windmill he could make?

---

8.

Find the 100<sup>th</sup> term in the following sequence:

7, 11, 15, 19, 23, ...

---

9. In Strawberry lane, all the houses on the left hand side of the road have odd numbers. If the first house number after a crossroads is 21 and the second is 23, what is the number of the 16th house on the left after the crossroads?

---

10.

Use the pattern below to calculate  $666666 \times 666666$

$$6 \times 6 = 36$$

$$66 \times 66 = 4356$$

$$666 \times 666 = 443556$$

$$6666 \times 6666 = 44435556$$

$$66666 \times 66666 = 4444355556$$

---

## Fractions

1. Calculate the following giving your answers as mixed numbers

$$3\frac{4}{7} + 2\frac{1}{2}$$

---

- 2.

$$4\frac{1}{6} - 1\frac{2}{3}$$

---

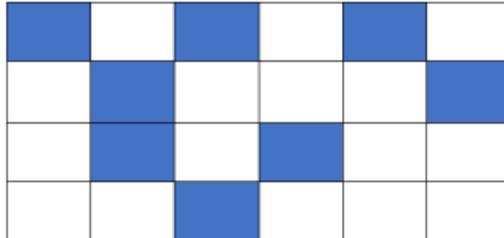
- 3.

$$3\frac{3}{5} \times 2\frac{1}{6}$$

---

4.

What fraction of the rectangle below is shaded?




---

5.

Put the following in order from smallest to largest:

0.25,  $\frac{2}{3}$ ,  $\frac{5}{12}$ , 0.75,  $\frac{1}{6}$

---

6.

Complete the following table:

Fraction	$\frac{3}{5}$		$\frac{7}{20}$	
Decimal		0.75		0.68

---

7.

Jenny bakes a pie and shares it with her brother and sister. If her brother eats  $\frac{1}{2}$  of the pie and her sister eats  $\frac{1}{6}$  of the pie, how much of the pie is left for Jenny?

---

8. Patrick makes a batch of 48 fairy cakes for his birthday. If he gives out 36 fairy cakes at school and eats another 4 on the way home, what fraction of the batch does he have left?

---

9.

Tim wants to send out Christmas cards. The cards come in packs of 9 and Tim buys 5 packs. If he only uses  $\frac{13}{15}$  of the cards he buys, how many cards does he have left over?

---

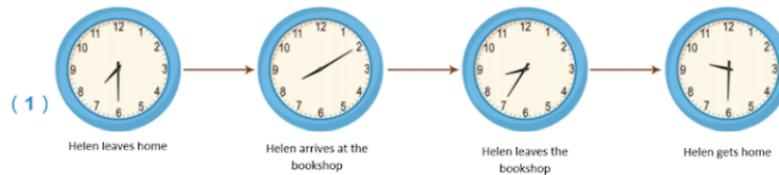
10.

David has some DVDs to sell. If he sells  $\frac{4}{9}$  of them and then has 40 left over, how many did he have to begin with?

---

## Date & Time

1.



Helen goes to buy some books. How long did she spend doing each of the following:

- Travelling to the bookshop?
- Shopping for books?
- Getting home from the bookshop?

2.

On her way home, Helen goes to the post office to pick up her parcels. Which of the 3 clocks shows the time at which Helen arrived at the post office?



(a)



(b)



(c)

Mark only one oval.

- (a)
- (b)
- (c)

3.

Jim and Alan started playing tennis at 2:20pm. Jim stopped playing at 4:30pm and Alan played for a total of 80 minutes.

- (a) How long did Jim play for?  
(b) At what time did Alan stop playing?

---

4. The time now is 09:00. What will the time be in 2800 hours?

---

5. Tom looks at his kitchen clock. The hour hand is pointing at the 5. Which number was the hour hand pointing at 200 hours earlier?

6.

**1<sup>st</sup> December, 2017 is a Friday. What day is 25<sup>th</sup> December, 2017?**

**A. Monday    B. Wednesday    C. Friday    D. Sunday    E. Tuesday**

*Mark only one oval.*

A

B

C

D

E

7.

Here is part of a train timetable.

Purley	.....	.....	.....	23:21	.....
East Croyden	22:56	23:01	23:10	23:27	23:30
Norwood Junc.	.....	.....	.....	.....	.....
London Bridge	.....	.....	.....	.....	.....
Clapham Junc.	23:07	23:13	23:21	23:37	23:40
Victoria	23:12	23:18	23:27	23:43	23:45

A train leaves East Croyden at 23:27.

How long does it take to get to Victoria?

- A. 6mins      B. 10mins      C. 13mins      D. 16mins      E. 26mins

Mark only one oval.

- A
- B
- C
- D
- E

8.

Femi takes 2 hours and 53 minutes to cycle from London to Reading. If he arrived at 3:21pm, at what time must he have set off?

A. 12:24pm   B. 1:24pm   C. 12:28pm   D. 12:18pm   E. 1:28pm

Mark only one oval.

A

B

C

D

E

9. My alarm clock goes off at 6:50. I snooze it for 5 minutes 3 times before getting up. I spend 45 minutes getting ready for school. My journey to school takes 35 minutes. What time do I arrive?

---

10. A train leaves London at 10:12 (24 hour clock). It stops 8 times with the final stop being Edinburgh. The train waits at each station along the way for 5 minutes so that passengers can get on and off. If each leg of the journey takes 4 minutes longer than the last and the first leg takes 15 minutes, what time does the train pull into Edinburgh station? (Give your answer as it would appear on a 24 hour clock).

---

## Word Problems 1

1. Farmer Joe keeps llamas and guinea fowls. Each llama has 4 legs and each guinea fowl has 2 legs. Farmer Joe asks his assistant Pip to count the animals for him one morning, but when Pip returns to the farmhouse, he only tells Farmer Joe that there are 150 animal legs in total. If Farmer Joe already knows that there are 23 llamas, how many guinea fowls are there?

---

2. The sum of 2 consecutive numbers is 87. What is the larger of the 2 numbers?

---

3. Matthew woke up on Friday morning and was very excited to see that it had snowed overnight! He went outside hoping to build a snowman, but unfortunately there wasn't enough snow. He measured the snowfall with a ruler. The next day, the snowfall was even lower: there was only half as much snow as on Friday. On Sunday however, there was 5 times as much snow as there was on Saturday and Matthew built his snowman! If the snowfall was 15cm on Sunday, what was the snowfall on Friday?

---

4. Laurence and Alex go to the sweet shop. Laurence buys 8 raspberry ripples and Alex buys 3 raspberry ripples and 3 sour strawberries. When they weigh their bags of sweets, Laurence notices that his bag weighs exactly the same as Alex's bag. How many sour strawberries would weigh the same as 20 raspberry ripples?

---

5. I think of a number, double it, add 3, divide by 7 and subtract 4. If the answer is 1, what number did I start with?

---

6. Alice is 1.2m tall. She plants a sunflower seed and waters it every day. The sunflower takes a week to emerge from the soil and once it does, it grows 7cm each day. How many days after planting the seed does the flower become taller than Alice?

---

7. Rebecca goes to the swimming pool after school. She can swim a length of the pool doing front crawl in 26 seconds and she can swim a length doing butterfly in 42 seconds. If she swims 15 lengths doing front crawl and then 5 lengths doing butterfly, how many minutes does she spend swimming?

---

8. Daniel buys a box of dog biscuits for his dog Spot. If the box contains 200 biscuits and Daniel gives Spot 7 biscuits each day, how many biscuits will Spot get on the day the box runs out?

---

9. Carmen goes to the museum and counts the number of cars in the car park. She finds that there are 150 cars in total parked in 4 rows. 5 minutes later, the science exhibit closes and some of the cars leave. 10 cars leave the first row, 11 leave the second, 12 leave the third and 13 leave the fourth. Carmen notices that all 4 rows now have the same number of cars parked in them. How many cars were in the second row when Carmen arrived?

---

10. It takes 5 builders 9 hours to build a house. How long would it take 12 builders to build the same house?

---

## Word Problems 2

1.

Peter is 13 years old and Sally is 9 years old. How many years will it be before their ages add up to 50?

---

2.

Anthony is 6 years old and his uncle is 25 years old. How old will Anthony be when his uncle is 50 years old?

---

3.

Oliver is 10 years old today. In 5 years' time, Oliver's age will be exactly a third of his mother's age. How old is Oliver's mother today?

---

4.

Janet receives £20 pocket money each week.  
This week, she spent £4.85 on toys at the shop.  
She then put a third of what was left in her piggy bank.  
How much money does she still have left to spend?

---

5.

Chris gets his hair cut every 2 weeks.  
 Moses gets his hair cut every 10 days.  
 They both get their hair cut on the same day. How long until this happens again?  
 (give your answer in weeks)

---

6.

Half of the pupils in a school are boys. One third of the boys play cricket. One quarter of those who play cricket are bowlers. One fifth of those boys who are bowlers are in form 8H. There are 8 cricket bowler boys in 8H. How many pupils are there at the school?

---

7.

On a game show, there are 3 doors.  
 Behind one door is £1 million, and behind another is a lump of coal.  
 There is nothing behind the other door.  
 Each door has a notice, however only one notice is true!  
 Which door should you open to find £1 million?

<p>Door 1</p> <p>There is <input type="checkbox"/> nothing behind door 3.</p>	<p>Door 2</p> <p>The coal is behind <input type="checkbox"/> this door.</p>	<p>Door 3</p> <p>The coal is behind <input type="checkbox"/> door 1.</p>
---	---	--

Mark only one oval.

- Door 1
- Door 2
- Door 3

8.

Frank has 1 hour to clean the house before his parents get home from their holiday. He has to vacuum 4 rooms, clean the bath and wipe off the drawing of a giraffe that he 'accidentally' did on the living room wall.

Each room takes 9 minutes to vacuum, it takes 18 minutes to clean the bath and 21 minutes to rub out the giraffe, which he does last.

What fraction of the giraffe is left on the wall when Frank's parents arrive home?

---

9.

I have 3 monkeys – Cheeky, Swingy and Bananas. When I weigh Cheeky and Swingy they come to 14kg more than Bananas. When I weigh Swingy and Bananas they weigh 10kg more than Cheeky and when I weigh Cheeky and Bananas they weigh 12kg more than Swingy. What is the combined weight of the 3 monkeys?

---

10.

Poppy is older than Georgia.

Bobby is older than Elle but younger than Georgia.

Johnny is younger than Poppy but Older than Elle.

Helen is younger than Poppy

Bobby is older than Johnny.

Georgia is younger than Helen.

Which of these six friends is the youngest?

*Mark only one oval.*

Poppy

Georgia

Bobby

Elle

Johnny

Helen

## Solutions

### Geometry

1.  $36^\circ$  (using angles in a triangle add up to  $180^\circ$  and angles on a straight line add up to  $180^\circ$ )
2.  $62^\circ$  (the missing angle in the left hand triangle is  $28^\circ$ . This joins with  $\angle OPQ$  to make a right angle so  $90 - 28 = 62^\circ$ )
3.  $97^\circ$  (angles in a quadrilateral add to  $360^\circ$  so  $A+C = 194^\circ$ .  $A=C = 97^\circ$ )
4. **B.**  $40^\circ$  (isosceles triangles have 2 equal angles and all three must add to  $180^\circ$ )
5.  $43^\circ$  (the triangle on the bottom right is right angled and its missing angle is  $54^\circ$ . We can then find the unmarked angle of the central triangle as it makes  $180^\circ$  together with the  $79^\circ$  and the  $54^\circ$ .  $X$  is then the remaining angle in the central right angles triangle so just use angles in a triangle add up to  $180^\circ$ )
6. **A and C**
7. (a) **Cuboid**, (b) **cylinder**, (c) **square based pyramid**, (d) **triangular based pyramid**
8. **A**
9. **B**
10. **E**

### Area

1.  $7.14\text{cm}^2$
2.  $126\text{m}^2$  ( $10 \times 15 - 4 \times 6$ )
3.  $83\text{m}^2$  ( $12 \times 9 - 5 \times 5$ )
4. 240 (20 paving stones will fit side by side along the 10m side of the garden and 12 along the 6m side. The garden will then be a  $20 \times 12$  grid of stones so 240 stones.)

5.  $72\text{m}^2$  (split into a triangle and a rectangle)
6.  $45\text{cm}^2$  (area of whole rectangle is  $72\text{cm}^2$  and area of shaded triangle is  $27\text{cm}^2$  so remaining area is  $72 - 27 = 45\text{cm}^2$ )
7. 4cm, 8cm, 2cm (each pair of width and height must multiply to make 24)
8.  $44\text{m}^2$  (subtract area of removed square from area of rectangle)
9.  $16\text{cm}^2$  (counting all half circles and quarter circles, the unshaded area is made up of 8 circles which have a total area of  $8 \times 7 = 56\text{cm}^2$ . Subtract this from the area of the rectangle.)
10.  $20\text{cm}^2$  (If we look at the area of 2 opposite semicircles combined, this fills the whole square apart from 2 white sections. 2 semicircles makes up  $28\text{cm}^2$  out of the total  $36\text{cm}^2$  of the square. So 2 white sections together make up  $8\text{cm}^2$ , so all 4 make up  $16\text{cm}^2$ . Then the shaded region is  $36 - 16 = 20\text{cm}^2$ ).

## Money

1. (i) £1.52, (ii) £12.90
2. 14 (500 divided by 34, ignore remainder)
3. 94p (Jacob spends  $3 \times £1.59 + £4.29 = £9.06$ , subtract from £10 for change)
4. £1.30 (£10.40 divided by 8)
5. 120 euros (multiply £5 by 20 to get £100 so multiply 6 euros by 20)
6. 100 dollars (90 euros converts to £75 which converts to £100)
7. Apples (28p is the only price which divides into £11.20)
8. 60 (£19 is 20 lots of 95p (28p + 31p + 36p) so 20 of each fruit)
9. £8.90 (£2.60 + £0.03 × 210)
10. 60 (he spends £1.80 less than Michael which is the price of 60 pages)

### Proportion

1. 440g (multiply recipe by 4)
2. (i) flour, (ii) 25g (If Sally uses all her chocolate, this is enough for 2.5 batches of muffins from the recipe in Q1. She would then need  $2.5 \times 50\text{g}$  of flour so 125g.)
3. 4 eggs, 200g flour, 28 cherries, 120g sugar, 60g butter (divide everything by 3 to find how much is needed for 2 people and add this to the amount needed for 6 people).
4. 15 (Isaac has enough to make 12 cakes with 50g left over. 50g is a quarter of 200g so he can make another 3 cakes with this.)
5. 200ml (1L is 5 parts so 1 part is 1L divided by 5 = 200ml)
6. 600ml (the 3L is made up of 5 parts total so each part is 600ml)
7. (a) 1 hour 50 minutes, (b) 2 hours 35 minutes
8. B (A has probability  $\frac{1}{2}$ , B has probability  $\frac{2}{3}$  (1,2,3,6 are factors of 6 so 4 out of 6) and C has probability  $\frac{4}{7}$ .  $\frac{2}{3}$  is the greatest of these.)
9.  $\frac{1}{25}$  (only 2 cards have this: 4 and 20. So  $\frac{2}{50}$  which simplifies to  $\frac{1}{25}$ .)
10.  $\frac{7}{30}$  (there are 6 multiples of 4 on green marbles (up to 24) and 8 multiples of 4 on blue marbles (up to 32) so 14 in total. There are 60 marbles in total so  $\frac{14}{60}$  which simplifies to  $\frac{7}{30}$ .)

### Statistics & probability

1. Dance (add number of boys to number of girls for each sport to compare)
2. 20
3. 130 (add all bars)
4. A. Louisiana (Louisiana has 6 vowels out of 9 letters so  $\frac{2}{3}$ . This is a higher probability than any other of these states).

5. (i)  $39.5^{\circ}\text{C}$ , (ii)  $36.8^{\circ}\text{C}$
6.  $37.5^{\circ}\text{C}$
7.  $1.2^{\circ}\text{C}$  (between 0:00 and 8:00 on the second day)
8. (i) 18 (12+6), (ii) 6
9. 8 (12+6+10 = 28. There are 36 children in total so 8 unaccounted for in the Venn diagram.)
10.  $\frac{2}{5}$  (8 prime numbers: 2,3,5,7,11,13,17,19 so  $\frac{8}{20}$  which simplifies to  $\frac{2}{5}$ )

### Patterns & Sequences

1. 44 (add 8 each time)
2. 25 (square numbers)
3. 19 (add 3 matchsticks each time, so add 9 more to pattern 3)
4. 13 (nth term is  $3n+1$ . If  $3n+1 = 40$ , then  $n = 13$ .)
5. 12
6. 88 (nth term for number of shapes is  $3n-2$  so if  $n=30$ , we need 88 shapes.)
7. 18 (pattern 18 uses 24 red squares and 27 blue squares)
8. 403 (nth term is  $4n + 3$ )
9. 51 (go up 15 steps of 2 from 21 so  $21 + 30 = 51$ )
10. 444443555556

### Fractions

1.  $6\frac{1}{14}$  (convert to improper fractions with a common denominator to add)
2.  $2\frac{1}{2}$  (convert to improper fractions with a common denominator to subtract)
3.  $7\frac{4}{5}$  (convert to improper fractions to multiply)

4.  $\frac{1}{3}$  (8/24 simplifies to  $\frac{1}{3}$ )
5.  $\frac{1}{6}, 0.25, \frac{5}{12}, \frac{2}{3}, 0.75$  (convert all to fractions with a common denominator to compare).
6.  $0.6, \frac{3}{4}, 0.35, \frac{17}{25}$
7.  $\frac{1}{3}$
8.  $\frac{1}{6}$  (8/48 simplifies to  $\frac{1}{6}$ )
9. 6 (Tim uses  $\frac{13}{15}$  of 45 cards total so 39 cards and has 6 left over
10. 72 (40 is  $\frac{5}{9}$  of the total so  $\frac{1}{9}$  is 8, so the total is  $9 \times 8 = 72$ ).

### Date & Time

1. (a) 40 minutes (time between first 2 clocks), (b) 25 minutes (time between 2<sup>nd</sup> and 3<sup>rd</sup> clock), (c) 55 minutes (time between last 2 clocks).
2. B (this is the only one which displays a time between when she leaves the bookshop and when she gets home).
3. (a) 2 hours 10 minutes, (b) 3:40pm
4. 01:00 (divide 2800 by 24 and find the remainder. The remainder is 16, so 16 hours after 09:00).
5. 9 (200/24 gives a remainder of 8. 8 hours before 5 is 9.)
6. A. Monday (24 days later so 3 weeks and 3 days).
7. D. 16 minutes
8. C. 12:28pm
9. 8:25 (15 minutes of snoozing, 45 minutes getting ready and 35 minutes travelling, so 1 hour and 35 minutes after getting up.)
10. 14:39 ( $7 \times 5 = 35$  minutes waiting time (the final stop is the destination so we don't need to count anything for the final stop). Add this to  $15 + 19 + 23 + 27 + 31 + 35 + 39 + 43$  journey time to get 4 hours 27 minutes.

**Word Problems 1**

1. 29 (92 of the legs are llama legs so 58 are guinea fowl legs.  
Divide by 2.)
2. 44 ( $87 + 1 = 88$ , divide by 2 = 44.  $43 + 44 = 87$ .)
3. 6cm ( $15\text{cm}/5 = 3\text{cm}$  on Saturday;  $3 \times 2 = 6\text{cm}$  on Friday.)
4. 12 (5 raspberry ripples weigh the same as 3 sour strawberries.  
 $5 \times 4 = 20$  so  $3 \times 4 = 12$ .)
5. 16 (follow the operations backwards and invert them: start with 1, add 4, multiply by 7, subtract 3, halve it and get 16.)
6. 25 days (120cm divided by 7 = 17 remainder 1, so 18 days after emerging from soil it passes 1.2m. Add the 7 days for it to emerge from soil.)
7. 10 minutes ( $15 \times 26$  seconds +  $5 \times 42$  seconds)
8. 4 (divide 200 by 7 and find the remainder.)
9. 37 (46 cars left total so there are now 104 left, so 26 in each row. 11 left the second so there were 37.)
10. 3 hours 45 minutes (1 builder would take  $5 \times 9 = 45$  hours. 12 would take  $45/12 = 3$  hours 45 minutes)

**Word Problems 2**

1. 14 ( the total of their ages now is 22. This needs to increase by 28 so 14 each.)
2. 31 (25 years later.)
3. 40 (Oli will be 15 and his mother 45 in 5 years time, so now, his mother is  $45 - 5 = 40$  years old.)
4. £10.10 (She has £15.15 left after buying toys. Divide by 3 to find how much goes in the piggy bank and subtract from £15.15.)

5. 10 weeks (Chris has his cut every 14 days and Moses every 10 days. 70 is the lowest common multiple of 10 and 14 so it'll be 70 days before they coincide.)
6. 960 ( $8 \times 5 \times 4 \times 3 \times 2$ .)
7. Door 3 (If door 1 is true, then 2 and 3 are false. 1 is true so there is nothing behind door 3 and 3 is false so there must be money behind door 1 and coal behind door 2. But this would make door 2 true which can't be as door 1 is true. Let's then suppose that door 2 is true and the coal is behind door 2. Door 1 is false so something is behind door 3. This must be the money. Door 3 is false as the coal is behind door 2. This is consistent so the money must be behind door 3. If we suppose that door 3 is true and 1 and 2 are false, this is consistent again. This time the coal is behind door 1, but the money is still behind door 3 so the money must be behind door 3.)
8.  $\frac{5}{7}$  (he spends 36 minutes vacuuming and 18 cleaning the bath so has 6 minutes left before his parents get home. He can hence only rub out  $\frac{6}{21} = \frac{2}{7}$  before they get home.)
9. 36kg ( $C+S = 14+B$ .  $S+B = 10 + C$ .  $C+B = 12+S$ . Adding all of these together, we see 2 lots of the 3 monkeys weighs the same as the 3 monkeys plus 36kg. So the total of the 3 monkeys is 36kg.)
10. Elle