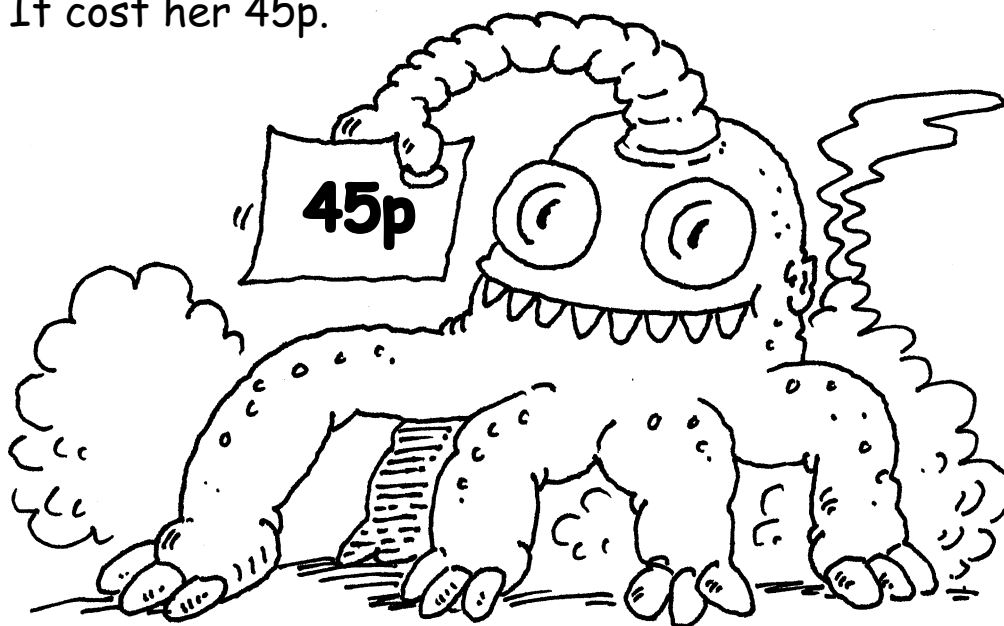


Monster

Alesha bought a monster using only silver coins.
It cost her 45p.



There are nine different ways to pay 45p exactly
using only silver coins.
Find as many as you can.

What if the monster cost 50p?
How many different ways are there to pay now?

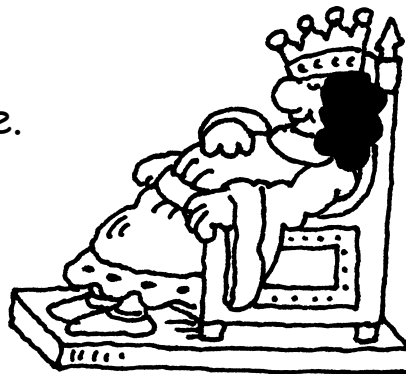
Teaching objectives

Solve mathematical problems or puzzles.
Find totals.
Work out which coins to pay.

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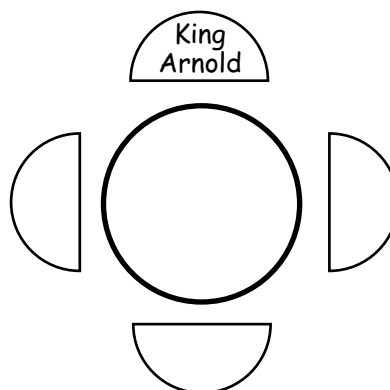
King Arnold

King Arnold sits at a Round Table.



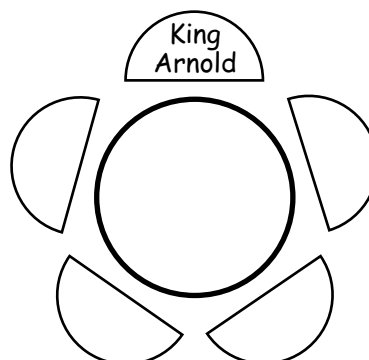
There are 3 empty seats.

In how many different ways
can 3 knights sit in them?



What if there are 4 empty seats?

In how many different ways
can 4 knights sit in them?



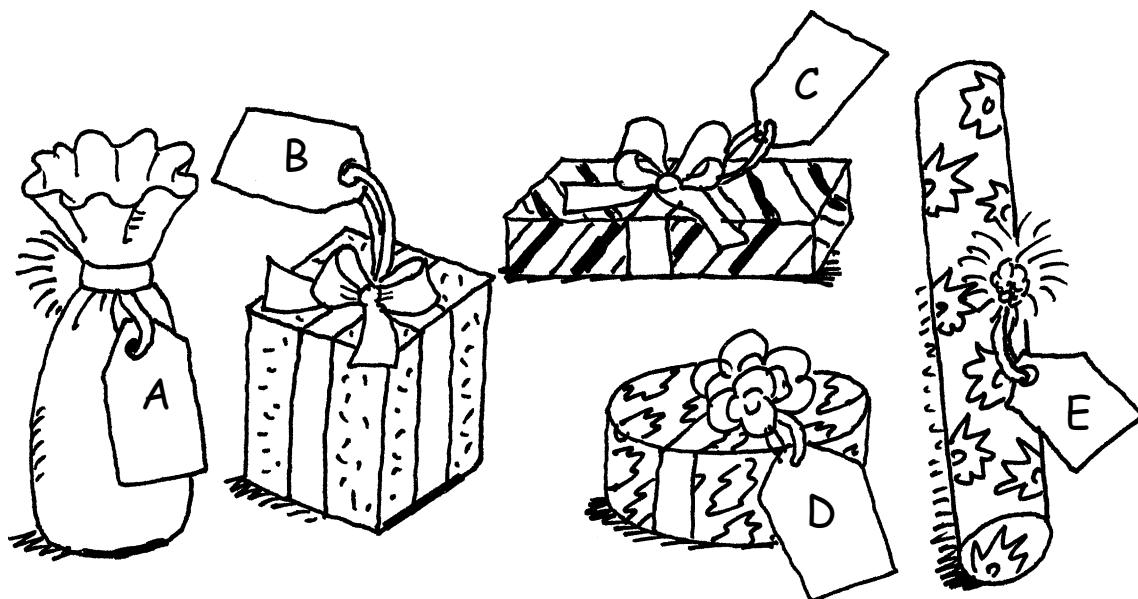
48

Teaching objectives

Solve mathematical problems or puzzles.
Solve a problem by organising information.
Explain methods and reasoning.

Presents

Gurmit paid £21 for five presents.



For A and B he paid a total of £6.

For B and C he paid a total of £10.

For C and D he paid a total of £7.

For D and E he paid a total of £9.

How much did Gurmit pay for each present?

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Teaching objectives

Solve a given problem by organising information.
Explain methods and reasoning.

Alesha's Monster

What clues do we have?

- ★ Alesha used only silver coins.
- ★ Her monster cost 45p.
- ★ There are nine ways to pay 45p using only silver coins.

What silver coins can we think of? Start at 1p and make a list of which ones are silver...

1p X 10p ✓ £1 X
2p X 20p ✓ £2 X
5p ✓ 50p ✓

So we can use:

5p 10p 20p 50p
do we need this?

My plan is to start with the biggest coins and work down - we know there are 9 ways -

1. 20p + 20p + 5p
2. 20p + 10p + 10p + 5p
3. 10p + 10p + 10p + 10p + 5p
4. 5p + 5p + 10p + 10p + 10p + 5p
- 5.
- 6.
- 7.
- 8.
9. Keep going ☺

How many different ways can three knights sit at King Arnold's table?

To help me solve this task, I'm going to use drawings, beads/coins/pebbles/Legos etc, and a grid for my results.



Use something to represent the three different knights - I'm using coins - 5p, 20p + 2p

I'm using a grid to record my results -

Seat 1	Seat 2	Seat 3
5p 2p	20p 5p	2p 20p

Hints

- ★ Watch out for duplicate seating patterns - if you are writing them on a grid, you should see them!
- ★ You will need to be watching when you do 4 empty seats - use that grid!

Gurmit's presents.

Look at the clues we have:

- ★ He paid £21 for 5 gifts
- ★ We know how much different combinations of gifts cost -

$$\begin{aligned} A+B &= £6 & B+C &= £10 \\ C+D &= £7 & D+E &= £9 \end{aligned}$$

This problem needs a systematic approach - you need to work through all the possible answers to get to the correct one. We are going to use some algebra to do this ☺

Let's start with $A+B = £6$

So we know A can be:

£1, £2, £3, £4 or £5

Let's try $A = £5$...

If $A+B = £6$ then $B = £1$

If $B+C = £10$ then $C = £9$

$C+D = £7$ oh C is £9...

$D+E = £9$ this can't be right!

Let's try $A = £4$...

If $A+B = £6$ then $B = £2$

If $B+C = £10$ then $C = £8$

If $C+D = £7$ oh again...

Keep trying!

- ★ Hint - remember the total cost of the gifts!

Answer sheet

Gurmit's Presents

Gurmit paid £2, £4, £6, £1 and £8 for the five presents.

King Arnold's Seats

Three knights can sit with King Arnold in 6 different ways.

Four knights can sit with King Arnold in 24 different ways.

Alesha's Monster

Alesha can use these coins to pay 45p:

two 20p and one 5p one 20p

two 10p and one 5p one 20p

one 10p and three 5p one 20p and five 5p

four 10p and one 5p

three 10p and three 5p

two 10p and five 5p

one 10p and seven 5p

nine 5p

There are 13 different ways to pay 50p using only silver coins.

First add 5p to each of the ways for 45p

The other four possibilities are:

two 20p and one 10p

one 20p and two 10p

five 10p

one 50p