

Chicken-and-Rabbit Problems

EXAMPLES

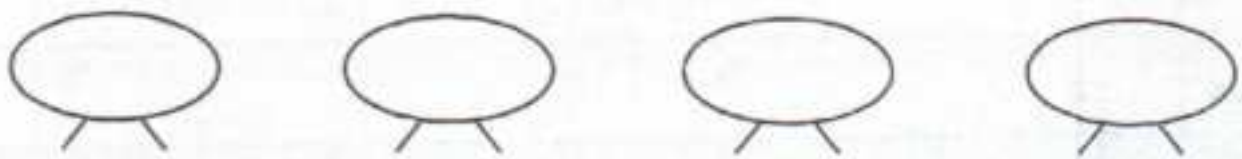
- 1 4 chickens and rabbits have 10 legs altogether. How many chickens are there? How many rabbits are there?

Method 1: Solve by Drawing

Step 1: We draw 4 ovals to represent the chickens and rabbits.



Step 2: Assume all were chickens,



$$2 \times 4 = 8$$

$$10 - 8 = 2$$

2 more legs are needed to add on.



There are **3** chickens and **1** rabbit.

Method 2: Make a Table

Step 1: We shall begin with 2 chickens and 2 rabbits.

No. of chickens	No. of legs	No. of rabbits	No. of legs	Total no. of legs
2	$2 \times 2 = 4$	2	$2 \times 4 = 8$	$4 + 8 = 12$

Step 2: Decrease the number of rabbits by 1. At the same time, increase the number of chickens by 1.

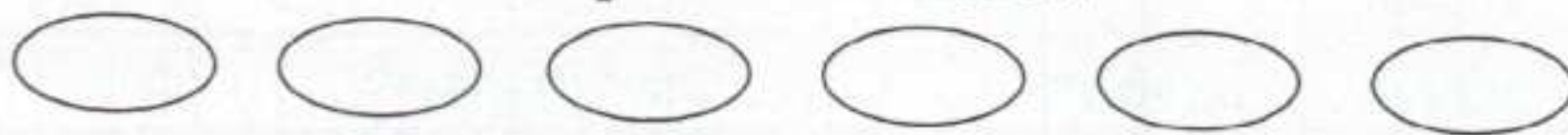
No. of chickens	No. of legs	No. of rabbits	No. of legs	Total no. of legs
2	$2 \times 2 = 4$	2	$2 \times 4 = 8$	$4 + 8 = 12$
3	$3 \times 2 = 6$	1	$1 \times 4 = 4$	$6 + 4 = 10$

There are **3** chickens and **1** rabbit.

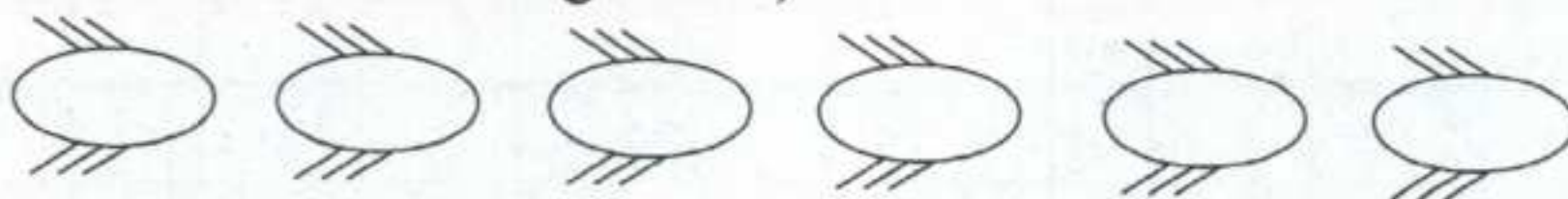
- 2 A spider has 8 legs.
A dragonfly has 6 legs.
6 spiders and dragonflies have 40 legs altogether.
How many spiders are there?
How many dragonflies are there?

Method 1: Solve by Drawing

Step 1: We draw 6 ovals to represent the insects.



Step 2: Assume all were dragonflies,



$$6 \times 6 = 36$$

$$40 - 36 = 4$$

4 more legs are needed to add on.



There are **2** spiders and **4** dragonflies.

Method 2: Make a Table

Step 1: We shall begin with 3 spiders and 3 dragonflies.

No. of spiders	No. of legs	No. of dragonflies	No. of legs	Total no. of legs
3	$3 \times 8 = 24$	3	$3 \times 6 = 18$	$24 + 18 = 42$

Step 2: $42 - 40 = 2$

Decrease the number of spiders by 1. At the same time, increase the number of dragonflies by 1.

No. of spiders	No. of legs	No. of dragonflies	No. of legs	Total no. of legs
3	$3 \times 8 = 24$	3	$3 \times 6 = 18$	$24 + 18 = 42$
2	$2 \times 8 = 16$	4	$4 \times 6 = 24$	$16 + 24 = 40$

There are **2** spiders and **4** dragonflies.

- 3 A pencil cost \$2. A pen cost \$4. David paid \$20 for 6 such pens and pencils. How many pens did he buy? How many pencils did he buy?

Method 1: Solve by Drawing

Step 1: If all were pencils,



$$6 \times \$2 = \$12$$

$$\$20 - \$12 = \$8$$

\$8 more are needed to add on.

Step 2: 

He bought 4 pens and 2 pencils.

Method 2: Make a Table

No. of pens	Value	No. of pencils	Value	Total value
3	$3 \times \$4 = \12	3	$3 \times \$2 = \6	$\$12 + \$6 = \$18$
4	$4 \times \$4 = \16	2	$2 \times \$2 = \4	$\$16 + \$4 = \$20$

He bought 4 pens and 2 pencils.

As the numbers get bigger, it becomes tedious to use methods 1 or 2.

We shall now introduce the third method to solve problems of this nature.

- 4 A farmer has 11 chickens and rabbits. These animals have a total of 30 legs.
How many chickens does he have?
How many rabbits does he have?

Method 3: Solve by Assuming

Step 1: If all were chickens,

$$11 \times 2 = 22$$

$$30 - 22 = 8$$

Why was there a shortage of 8 legs?

Some rabbits were counted as chickens.

Step 2: A chicken has 2 legs.

A rabbit has 4 legs.

The difference in the number of legs is

$$4 - 2 = 2.$$

Step 3: $8 \div 2 = 4$ rabbits

$$11 - 4 = 7 \text{ chickens}$$

He has 4 rabbits and 7 chickens.

- 5 Andrea paid \$45 in all for 12 pieces of five-dollar and two-dollar stamps.
How many pieces of two-dollar stamps did she buy?
How many pieces of five-dollar stamps did she buy?

Method 3: Solve by Assuming

Step 1: If all were two-dollar stamps,

$$12 \times \$2 = \$24$$

$$\$45 - \$24 = \$21$$

There was a shortage of \$21 as some stamps were of five-dollar value.

Step 2: $\$5 - \$2 = \$3$

The difference in value between the two types of stamps is \$3.

Step 3: $\$21 \div \$3 = 7$ pieces of five-dollar stamps

$$12 - 7 = 5 \text{ pieces of two-dollar stamps}$$

She bought 7 pieces of five-dollar stamps and 5 pieces of two-dollar stamps.

PRACTICE



- 1 There are 8 cars and motorcycles in a car park. There are a total of 26 wheels.
How many cars are in the car park?
How many motorcycles are in the car park?

Method 1: Solve by Drawing

Method 2: Make a Table

No. of cars	No. of wheels	No. of motorcycles	No. of wheels	Total no. of wheels

- 2 An adult movie ticket cost \$8.
A child movie ticket cost \$5.
Mr Fox paid \$31 in all for 5 movie tickets.
How many adult movie tickets did he buy?
How many child movie tickets did he buy?

Method 1: Solve by Drawing

Method 2: Make a Table

No. of adult movie tickets	Value	No. of child movie tickets	Value	Total value

- 3 A science fiction book cost \$5.
A book on adventures cost \$3.
Louisa paid \$26 in all for 6 books.
How many science fiction books did she buy?
How many books on adventures did she buy?

Method 1: Solve by Drawing

Method 2: Make a Table

No. of science fiction books	Value	No. of books on adventures	Value	Total value

- 4 A tricycle has 3 wheels.
A bicycle has 2 wheels.
8 tricycles and bicycles have 22 wheels altogether.
How many tricycles are there?
How many bicycles are there?

Method 1: Solve by Drawing

Method 2: Make a Table

No. of bicycles	No. of wheels	No. of tricycles	No. of wheels	Total no. of wheels

- 5 A farmer has 12 chickens and rabbits.
There are 34 legs altogether.
How many chickens does the farmer have?
How many rabbits does the farmer have?

Method 1: Solve by Drawing

Method 2: Make a Table

No. of chickens	No. of legs	No. of rabbits	No. of legs	Total no. of legs

- 6 A farmer has 17 chickens and rabbits.
He counts 52 legs in all.
How many chickens does he have?
How many rabbits does he have?

Method 1: Make a Table

No. of chickens	No. of legs	No. of rabbits	No. of legs	Total no. of legs

Method 2: Solve by Assuming

- 7 A big box can hold 12 marbles.
A small box can hold 6 marbles.
84 marbles are to be placed into 10 boxes.
How many big boxes are there?
How many small boxes are there?

Method 1: Make a Table

No. of big boxes	No. of marbles	No. of small boxes	No. of marbles	Total no. of marbles

Method 2: Solve by Assuming

- 8 A spider has 8 legs.
A dragonfly has 6 legs.
10 spiders and dragonflies have 68 legs altogether.
How many spiders are there?
How many dragonflies are there?

Method 1: Solve by Drawing

Method 2: Solve by Assuming

- 9 Randy paid \$16 in all for 11 two-dollar and one-dollar stamps.
How many two-dollar stamps did he buy?
How many one-dollar stamps did he buy?

Method 1: Solve by Drawing

Method 2: Solve by Assuming

- 10 A truck has 6 wheels.
A car has 4 wheels.
14 trucks and cars parked in a car park have a total of 72 wheels.
How many trucks are there?
How many cars are there?

Method 1: Make a Table

No. of trucks	No. of wheels	No. of cars	No. of wheels	Total no. of wheels

Method 2: Solve by Assuming