Algebra: linear sequences

Examples

1 Find the next two numbers in the following **sequence**:
3, 4, 6, 9, 13, … , …

Answer:

Look to see what is being added or multiplied to get to the next **term**:
3, 4, 6, 9, 13, … , …
+1 +2 +3 +4 +5 +6
So the answers are 18 and 24

2 Find the next term in the sequence:
1, 1, 2, 3, 5, 8, 13, ….

Answer:

There are some special sequences:
1, 3, 6, 10, 15, ...
Triangular numbers, which form triangles where the difference between each term increases by 1 each time.

1, 4, 9, 16, 25, 36, …
Square numbers, which forms squares and the terms are 1^2, 2^2, 3^2, 4^2, …

1, 1, 2, 3, 5, 8, 13, …
Fibonacci numbers which are found by adding the two previous terms.

So the answer is 21 since they are Fibonacci numbers.

3 Find a pair of numbers which satisfies the following:
I double the first number then add the second number to get a total of 10

Answer:

$2x + y = 10$
2(0) + (10) = 10
2(1) + (8) = 10
2(2) + (6) = 10
2(3) + (4) = 10
2(4) + (2) = 10
2(5) + (0) = 10
All the above combinations work.

Ⓐ Answer these questions. You do not need to show your workings out.

1 Find the next two terms in the following sequence:
5, 6, 7, 8, 9, …, … _____ _____ [2]

2 Find the next two terms in the following sequence:
12, 15, 18, 21, 24, …, … _____ _____ [2]

3 Find the next two terms in the following sequence:
15, 13, 11, 9, 7, …, … _____ _____ [2]

4 Find the next two terms in the following sequence:
2, 2, 4, 6, 10, …, … _____ _____ [2]

Circle your answers to the following questions.

5 I add the first number to three lots of the second number and the result is 10

a 1, 2 **b** 2, 3 **c** 8, 1 **d** 5, 2 **e** 4, 2 [1]

6 I add twice the first number to the second number and the result is 14

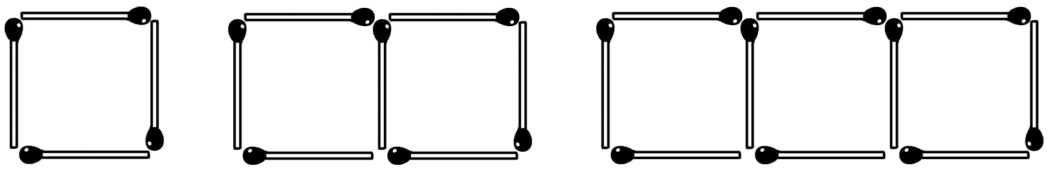
a 4, 5 **b** 5, 4 **c** 10, 4 **d** 4, 1 **e** 3, 4 [1]

7 I add three times the first number to two lots of the second number and the result is 13

a 10, 3 **b** 3, 2.5 **c** 2.5, 6.5 **d** 3, 2 **e** 4, 2 [1]

Ⓑ Answer these questions and show your workings out.

1



Four matches are arranged to make a square, as above. More matches are added to make 2 squares, and then 3 squares. How many matches will be needed to make 4 squares and 7 squares?

4 squares require _____ matches.
7 squares require _____ matches.

Show your workings

[2]

2

Two pens and two pencils cost £3.70. Which of the following prices are correct? Circle the correct options.

a pen £1.30, pencil £0.45

b pen £1.30, pencil £0.55

c pen £1.25, pencil £0.65

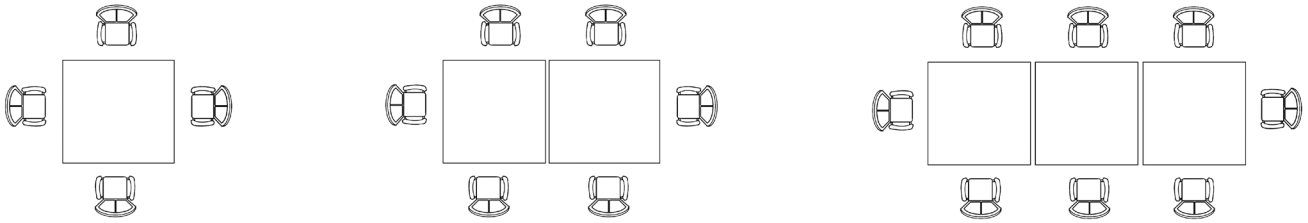
d pen £1.15, pencil £0.70

e pen £1.05, pencil £0.80

Show your workings

[2]

3



A restaurant has different arrangements of tables and chairs. Above you can see them using one, two and three tables.
How many chairs are needed with 4 tables and 10 tables?

4 tables require _____ chairs. 10 tables require _____ chairs.

Show your workings

[2]

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4 The Bond family have three triplets at primary school and a pair of twins at secondary school. Their combined ages are 47. How old are the children?

The triplets are _____ and the twins are _____ or, the triplets are _____ and the twins are _____ .

Show your workings

[2]

Ⓒ Answer these questions. You do not need to show your workings out.

1 Find the next two terms in the following sequence:
7, 5, 3, 1, …, …

[2]

2 Find the next two terms in the following sequence:
2.3, 5.2, 8.1, …, …

[2]

3 Find the next two terms in the following sequence:
3, 4, 6, 9, 13, …, …

[2]

Circle the correct answers below.

4 I add the first number to three lots of the second number and the result is 9.4

a 6.3, 3.1 **b** 2.3, 2.2 **c** 6.1, 1.1 **d** 5.2, 1.1 **e** 1.1, 3.1

[1]

5 I add half the first number to twice the second number and the result is 8

a 6.8, 2.3 **b** 1.7, 2.3 **c** 6.8, 4.6 **d** 10, 2 **e** 10, 1

[1]

6 I add three times the first number to half of the second number and the result is 9

a 2, 8 **b** 3, 0 **c** 0, 4.5 **d** 2.3, 4.3 **e** 5, -6

[1]

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Unit 2

A

1 10, 11
2 27, 30
3 5, 3
4 16, 26
5 **e** 4, 2
6 **b** 5, 4
7 **d** 3, 2

B

1 13, 22
2 **b** and **e**
3 10, 22
4 5 and 16 or 7 and 13

C

1 -1, -3
2 11, 13.9
3 18, 24
4 **c** 6.1, 1.1
5 **a** 6.8, 2.3
6 **b** 3, 0