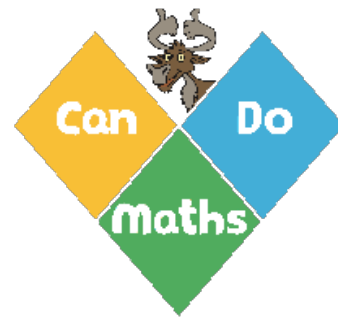




# Colin and Coco's Deliberate Practice

Year 6 Unit 13

Algebra **Answers**





# Contents

This pack of deliberate practice is designed to be used flexibly to secure the manageable steps of this unit.

The table below indicates which activities are linked to which manageable steps.

|                                                                                                                            | Do It | Challenge It | Play It |
|----------------------------------------------------------------------------------------------------------------------------|-------|--------------|---------|
| Use simple formulae expressed in words (e.g. time needed to cook a chicken: allow 20 minutes plus 40 minutes per kilogram) | 1     |              |         |
| Know the basic rules of algebraic notation                                                                                 |       |              | 1       |
| Express missing number problems algebraically                                                                              |       | 1            |         |
| Find combinations of two variables                                                                                         |       |              | 2       |
| Find pairs of numbers that satisfy an equation with two unknowns e.g. $a + b = 15$                                         | 2     |              |         |
| Generate a linear sequence from its description                                                                            |       | 2            |         |
| Describe and find the next terms of a linear sequence                                                                      | 3     |              |         |
| Find a missing term in a linear sequence                                                                                   |       |              | 3       |
| Describe a number pattern algebraically                                                                                    |       | 3            |         |



Complete the tables:

Time to cook a cockatoo  
= 40 minutes plus 20 minutes per kg

| Weight (kg) | Time (mins) |
|-------------|-------------|
| 2           | 80          |
| 3           | 100         |
| 4           | 120         |
| 5           | 140         |
| 10          | 240         |

Price for a Painter  
Price = £20 + £15 × number of hours

| Hours | Price (£) |
|-------|-----------|
| 1     | 35        |
| 2     | 50        |
| 5     | 95        |
| 7.5   | 132.50    |

## Challenge It 1

All the missing number problems have a solution  $n = 3$   
Find the missing digits.  
Solve each equation in several different ways.

$$\boxed{4}n = 1\boxed{2}$$

$$\boxed{3}n = \boxed{9}$$

$$n + \boxed{7} = \boxed{1}\boxed{0}$$

$$8n - \boxed{8} = \boxed{1}\boxed{6}$$

Solve missing number problems altogether using the digits  
0, 1, 2, 3, 4, 5, 6, 7, 8 and 9

Which digit do you not use? 5  
Create a missing number problem with this solution.



# The Language of Algebra Game

Play It 1

You need:  
Algebra cards

To play:  
The cards are mixed up and placed face down.  
Player 1 turns over one card.  
Player 1 turns over another card.  
If the cards match, player 1 keeps the pair.  
If the cards are not equivalent, the cards are turned face down.  
Player 2 turns over two cards to try and find a matching pair.

To win:  
The winner is the player with the most pairs.

|               |                          |         |                             |
|---------------|--------------------------|---------|-----------------------------|
| $\frac{n}{2}$ | $n$<br>divided by<br>$2$ | $n + 2$ | $2$<br>more than<br>$n$     |
| $n^2$         | $n$<br>squared           | $2 - n$ | Subtract<br>$n$<br>from $2$ |
| $2n$          | Double<br>$n$            | $n - 2$ | Subtract<br>$2$<br>from $n$ |



The unknowns are positive whole numbers.  
Find all the pairs of numbers that satisfy:

$$a + b = 8$$

| a | b |
|---|---|
| 1 | 7 |
| 2 | 6 |
| 3 | 5 |
| 4 | 4 |
| 5 | 3 |
| 6 | 2 |
| 7 | 1 |

$$2m + n = 10$$

| m | n |
|---|---|
| 1 | 8 |
| 2 | 6 |
| 3 | 4 |
| 4 | 2 |

The unknowns are one digit numbers.  
Find all the pairs of numbers that satisfy:

$$a - b = 3$$

| a | b |
|---|---|
| 9 | 6 |
| 8 | 5 |
| 7 | 4 |
| 6 | 3 |
| 5 | 2 |
| 4 | 1 |
| 3 | 0 |

$$7 - x = y$$

| x | y |
|---|---|
| 0 | 7 |
| 1 | 6 |
| 2 | 5 |
| 3 | 4 |
| 4 | 3 |
| 5 | 2 |
| 6 | 1 |
| 7 | 0 |

Match the start number with the description  
with the linear sequence.  
Find the missing buddies.

| Start number | Description | Linear Sequence     |
|--------------|-------------|---------------------|
| 2            | Add 1       | ..., 6, 10, 14, ... |
| 3            | Add 2       | ..., 6, 11, 16, ... |
| 1            | Subtract 3  | ..., 9, 12, 15, ... |
| 6            | Add 4       | ..., 5, 7, 9, ...   |
| 4            | Subtract 4  | ..., 5, 3, 1, ...   |
| 7            | Add 5       | ..., 5, 6, 7, ...   |
| 9            | Add 3       | ..., 7, 4, 1, ...   |
| 10           | Subtract 2  | ..., 7, 6, 5, ...   |
| 8            | Subtract 1  | ..., 5, 1, ...      |



# What's the value? Game

Play It 2

You need:

Two 1 - 6 dice

Expression cards

To play:

The cards are mixed up and placed face down.

Player 1 turns over one card.

Player 1 rolls both dice.

Player 1 decides which number will be the value of 'a' and 'b'.

Player 1 works out the value of the card

Player 2 turns over one card.

Player 2 rolls both dice.

Player 2 decides which number will be the value of 'a' and 'b'.

Player 2 works out the value of the card

The player with the largest value scores one point.

To win:

The winner is the first player to score 10 points.

Expression Cards

$$a + b$$

$$a + 2b$$

$$a - b$$

$$2a - b$$

$$2a + b$$

$$a - 2b$$



Do It 3

Describe the linear sequences:

Find the next 2 terms of the sequences

2, 5, 8, 11, 14, ...

Add 3

1, 4, 7, ... , ...

10, 13

3, 7, 11, 15, 19, ...

Add 4

2, 6, 10, ... , ...

14, 18

1, 5, 9, 13, 17, ...

Add 4

3, 9, 15, ... , ...

21, 27

25, 20, 15, 10, 5, ...

Subtract 5

15, 13, 11, ... , ...

9, 7

13, 11, 9, 7, 5, ...

Subtract 2

21, 16, 11, ... , ...

6, 1

Find the missing numbers and describe the pattern algebraically.

Challenge It 3

| a | b |
|---|---|
| 1 |   |
| 2 |   |
| 3 |   |
| 4 |   |
| 5 |   |

| m | n |
|---|---|
| 1 |   |
| 2 |   |
| 3 |   |
| 4 |   |
| 5 |   |

| x | y |
|---|---|
| 1 |   |
| 2 |   |
| 3 |   |
| 4 |   |
| 5 |   |

$$b = a + \square$$

$$n = \square m$$

$$y = \square x + \square$$

Solve each one in several different ways.



## Sequence Game

Play It 3

You need:  
0 - 9 dice

To play:  
Players take turns to roll the dice twice to get two digits.  
They use the numbers to create two 2-digit numbers.

For example, if a player rolls a '2' and a '4', they create the numbers 24 and 42.

These numbers are the 1st and 3rd numbers in a linear sequence.

For example, 24,  42, ... , ....

Each player works out the value of the second term and this is their score.

To win:  
The winner is the first player to score over 200 points.