



Coded Addition - set samples - paper 1

Find A, B, C and D. Within each question, they represent four different digits (0–9).

Repeated letters have the same value. A letter can have the same value as a number already shown in the addition.

Numbers cannot start with zero, but zero is allowed elsewhere.

1.

$$\begin{array}{r} A \ A \ B \\ + \quad 1 \ 8 \\ \hline C \ D \ 2 \end{array}$$

A = _____ B = _____

C = _____ D = _____

3.

$$\begin{array}{r} A \ B \ A \\ + \quad 3 \ 7 \\ \hline C \ D \ 8 \end{array}$$

A = _____ B = _____

C = _____ D = _____

2.

$$\begin{array}{r} A \ A \ A \\ + \quad \quad 7 \ 6 \\ \hline B \ 0 \ C \ D \end{array}$$

A = _____ B = _____

C = _____ D = _____



Coded Addition - set samples - Answers

Work through the columns. When a column totals 10 or more, write the units digit and carry 1.

1.

$$\begin{array}{r} 884 \\ + 18 \\ \hline 902 \end{array}$$

Answer: A = 8, B = 4, C = 9, D = 0
Check: $884 + 18 = 902$

Step-by-step working:

Units column: To write 2, B + 8 must be 12. $4 + 8 = 12$; write 2, carry 1. So B = 4.

Hundreds column: A and C are different digits. There must be a carried 1 from the tens column; without it they would be equal.

Tens column: A + 1 + 1 must be at least 10 to carry 1, so A is at least 8.

Hundreds column: The answer has only three digits, so A + 1 must be less than 10. Therefore A is at most 8.

So A = 8.

Tens column: $8 + 1 + 1 = 10$ (including the carried 1); write 0, carry 1. So D = 0.

Hundreds column: $8 + 1 = 9$ (including the carried 1); write 9, no carry. So C = 9.

2.

$$\begin{array}{r} 999 \\ + 76 \\ \hline 1075 \end{array}$$

Answer: A = 9, B = 1, C = 7, D = 5
Check: $999 + 76 = 1075$

Step-by-step working:

Hundreds and thousands columns: The total shown has four digits, so there must be a carry from the hundreds column into the thousands column. Therefore the thousands digit is 1.

The hundreds column must reach 10. Since A is at most 9, it must be 9 with a carried 1 from the tens column: $9 + 1 = 10$.

So A = 9, B = 1; write 0 in the hundreds and 1 in the thousands.

Units column: $9 + 6 = 15$; write 5, carry 1. So D = 5.

Tens column: $9 + 7 + 1 = 17$ (including the carried 1); write 7, carry 1. So C = 7.

3.

$$\begin{array}{r} 171 \\ + 37 \\ \hline 208 \end{array}$$

Answer: A = 1, B = 7, C = 2, D = 0
Check: $171 + 37 = 208$

Step-by-step working:

Units column: To write 8, A + 7 must be 8. $1 + 7 = 8$; write 8, no carry. So A = 1.

Hundreds column: A and C are different digits. There must be a carried 1 from the tens column; without it they would be equal.

Hundreds column: $1 + 1 = 2$ (including the carried 1); write 2, no carry. So C = 2.

Tens column: B + 3 must reach at least 10 to carry 1. The column sum allows B = 7, 8, 9.

Option	Column check	Result
B = 7	$7 + 3 = 10$; D = 0. Fits the column and digit rules.	Keep
B = 8	$8 + 3 = 11$; D = 1. D cannot be 1 because A = 1 and different letters must have different digits.	Rule out
B = 9	$9 + 3 = 12$; D = 2. D cannot be 2 because C = 2 and different letters must have different digits.	Rule out

This leaves B = 7. $7 + 3 = 10$; write 0, carry 1. So B = 7, D = 0.