

Thursday 23.5.19

SPICY

WALT use column addition to calculate amounts of money

Rewrite these problems in your books to calculate the answer

1) £13.59 + £48.05

2) £68.60 + £27.98

3) £22.89 + £9.16

4) £56.80 + £62.75

5) £123.65 + £83.06

6) £245.27 + £9.59

7) £45.94 + £99.09

8) £24.50 + £12.09 + £34.75

9) £8.65 + £312.50 + £23.97

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WALT find missing values in decimal addition calculations

Rewrite these problems in your books to calculate the answer

$$\begin{array}{r}
 1) \quad 34.\square 1 \\
 + 1\square.59 \\
 \hline
 \pounds 48.0\square
 \end{array}$$

$$\begin{array}{r}
 3) \quad 348.\square 9 \\
 + \quad \square.4\square \\
 \hline
 \pounds 3\square 7.03
 \end{array}$$

$$\begin{array}{r}
 2) \quad 35.\square 8 \\
 + 2\square.4\square \\
 \hline
 \pounds \square 3.61
 \end{array}$$

$$\begin{array}{r}
 4) \quad 4\square.45 \\
 + \quad \square.5\square \\
 \hline
 \pounds 49.03
 \end{array}$$

How many possibilities can you find for calculation number 4? You need to explain how you worked systematically to avoid missing any possibilities.

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SUPER CHALLENGE

WALT solve multi-step money problems

Rewrite these problems in your books to calculate the answer

4	1	7
7	4	1
1	7	4

This is an example of a magic square.

The total of every column, row and diagonal needs to be
3x the value in the middle.

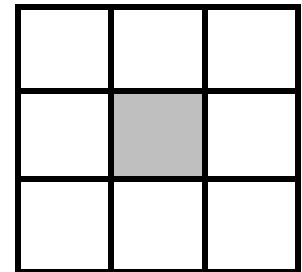
The middle value in this square is 4, so all of the columns, rows and diagonals equal 12 (3×4).

Fatima decides to make all of the magic squares that she can using **only these prices** in each box:

£2	£2.20	£2.40	£2.60	£2.80
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She can use each price more than once if she likes, but each one must be used **at least once** in the magic square.

How many possibilities can you find?



Here the sum has to be 2.4. No we can make $3 \times 2.4 = 7.2$ in a number of ways. These are by using 2.0, 2.4 and 2.8; 2.0, 2.6 and 2.6; 2.2, 2.2 and 2.4, 2.4 and 2.4. (These are the only possibilities. This can be shown by making a systematic list.)

inue systematically.

the main diagonal is 2.0, 2.4, 2.8. Then what can go into the centre top row square? It can't be 2.0 (or 2.2) since there is no number that, along with 2.4, 2.4 and 2.4. (These are the only possibilities. This can be shown by making a systematic list.)

gives 7.2. But it can be 2.4, 2.6 or 2.8. We take each of these in turn.

we get a problem where the question marks are. In the third case we get a magic square (B).

2.0	2.4	2.8
2.4	??	
2.8		

2.0	2.6	2.6
2.4	??	
2.8		

the main diagonal is 2.2, 2.4, 2.6. Then the top row centre square has to be 2.2, 2.4, 2.6 or 2.8. Here we seem to get three answers but the first is the same (flip the third one about the main diagonal). So we get two new magic squares here, C and D.

2.2	2.4	2.6
2.8	2.4	2.0
2.2	2.4	2.6

2.2	2.6	2.4
2.6	2.4	2.2
2.4	2.0	2.6

2.2	2.8	2.2
2.4	2.4	2.4
2.6	2.0	2.6

only possibility left is 2.4, 2.4, 2.4 down the main diagonal. This leaves the five numbers 2.0, 2.2, 2.4, 2.6 and 2.8 as possibilities for the top row putting 2.4 in there, we are forced to have all of the entries equal to 2.4, so we omit this possibility.

2.4	2.2	2.6
2.6	2.4	2.2
2.2	2.6	2.4

2.4	2.6	2.2
2.2	2.4	2.6
2.6	2.2	2.4

2.4	2.8	2.0
2.0	2.4	2.8
2.8	2.0	2.4

looks as if we have found four more answers. However, the first and last one both have 2.0, 2.4 and 2.8 along a diagonal and so can be rotated over with 2.0, 2.4 and 2.8 along the main diagonal. And the second and third are the same – just flip the third one about the main diagonal. So one new answer E (the second one).