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Math Homework: Connecting Averages (Puzzle 1)

How I figured it out:

This puzzle has a grid of 4 boxes in a square! Each box has 2 circles next to it, and it also touches 2 other boxes.

Let's give each box a letter name so it is easy to track:

• **A** is the top-left box.

• **B** is the top-right box.

• **C** is the bottom-left box.

• **D** is the bottom-right box.

My Equations for each box:

For box A: The numbers around it are circles 7 and 2, plus boxes B and C.

$4 \times A = 7 + 2 + B + C$

$4 \times A = 9 + B + C$ — (Equation 1)

For box B: The numbers around it are circles 7 and 4, plus boxes A and D.

$4 \times B = 7 + 4 + A + D$

$4 \times B = 11 + A + D$ — (Equation 2)

For box C: The numbers around it are circles 9 and 6, plus boxes A and D.

$4 \times C = 9 + 6 + A + D$

$4 \times C = 15 + A + D$ — (Equation 3)

For box D: The numbers around it are circles 10 and 19, plus boxes B and C.

$4 \times D = 10 + 19 + B + C$

$4 \times D = 29 + B + C$ — (Equation 4)

Finding the numbers:

First, I notice that the right side of Equation 1 and Equation 4 both use (B + C)!

4 × D = 29 + B + C

Since 9 + B + C = 4 × A, then B + C = (4 × A) - 9.

So, 4 × D = 29 + (4 × A) - 9

4 × D = 20 + 4 × A

Divide everything by 4: **D = 5 + A**

Next, I compare Equation 2 and Equation 3. Both use (A + D)!

4 × C = 15 + A + D

4 × B = 11 + A + D

If we subtract them: (4 × C) - (4 × B) = 15 - 11 = 4.

Divide by 4: **C - B = 1**, which means **C = B + 1**.

Now let's put **D = 5 + A** into Equation 2:

4 × B = 11 + A + (5 + A)

4 × B = 16 + 2 × A

Divide by 2: 2 × B = 8 + A, so **A = 2 × B - 8**.

Now let's use Equation 1 with our new clues (C = B + 1 and A = 2 × B - 8):

4 × (2 × B - 8) = 9 + B + (B + 1)

8 × B - 32 = 10 + 2 × B

Move the B's to one side and numbers to the other:

6 × B = 42

B = 42 ÷ 6

B = 7

Now I can find all the other boxes easily!

• **C** = B + 1 = 7 + 1 → **C = 8**

• **A** = 2 × 7 - 8 = 14 - 8 → **A = 6**

• **D** = 5 + A = 5 + 6 → **D = 11**

My Final Answers:
Top-Left Box (A) = 6
Top-Right Box (B) = 7
Bottom-Left Box (C) = 8
Bottom-Right Box (D) = 11

Checking my answers:

• Top-Left Box: (7 + 2 + 7 + 8) ÷ 4 = 24 ÷ 4 = 6. (Works!)

• Top-Right Box: (7 + 4 + 6 + 11) ÷ 4 = 28 ÷ 4 = 7. (Works!)

• Bottom-Left Box: (9 + 6 + 6 + 11) ÷ 4 = 32 ÷ 4 = 8. (Works!)

• Bottom-Right Box: (10 + 19 + 7 + 8) ÷ 4 = 44 ÷ 4 = 11. (Works!)