Area Maze — Practice

CKSTEM Math Problem Solving · Grades 4–7

1 IF TWO RECTANGLES SHARE A WALL AND ONE RECTANGLE'S AREA + THAT-SIDE IS KNOWN, THEN THAT SIDE'S LENGTH = AREA ÷ SIDE; THE SHARED WALL IS THE SAME IN BOTH.

Two rectangles sit side by side and share a vertical wall. The left rectangle has area 10 square centimeters and is 2 centimeters wide. The right rectangle is 4 centimeters wide. What is the area of the right rectangle?

WORK IT OUT HERE

2 IF TWO RECTANGLES SHARE A WALL AND ONE RECTANGLE'S AREA + THAT-SIDE IS KNOWN, THEN THAT SIDE'S LENGTH = AREA ÷ SIDE; THE SHARED WALL IS THE SAME IN BOTH.

A picture frame is made from two rectangles that share one vertical wall. The left rectangle has area 18 square centimeters and is 3 centimeters wide. The right rectangle is 5 centimeters wide. What is the area of the right rectangle?

WORK IT OUT HERE

3 IF TWO RECTANGLES SHARE A WALL AND ONE RECTANGLE'S AREA + THAT-SIDE IS KNOWN, THEN THAT SIDE'S LENGTH = AREA ÷ SIDE; THE SHARED WALL IS THE SAME IN BOTH.

Two rectangles share one vertical wall. The left rectangle has area 42 square centimeters and is 6 centimeters wide. The right rectangle is 8 centimeters wide. What is the area of the right rectangle?

WORK IT OUT HERE

4 IF A LENGTH RECOVERED IN ONE PLACE IS NEEDED ELSEWHERE, THEN WALK IT ACROSS THE FIGURE, ADDING OR SUBTRACTING THE KNOWN OFFSETS BETWEEN RECTANGLES.

Two rectangles form a step shape. The top rectangle has area 24 square centimeters and is 4 centimeters tall. The bottom rectangle sticks out 2 centimeters to the right of the top, lines up on the left, and is 3 centimeters tall. What is the area of the bottom rectangle?

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5 IF A LENGTH RECOVERED IN ONE PLACE IS NEEDED ELSEWHERE, THEN WALK IT ACROSS THE FIGURE, ADDING OR SUBTRACTING THE KNOWN OFFSETS BETWEEN RECTANGLES.

Two rectangles form a step shape. The top rectangle has area 40 square centimeters and is 5 centimeters tall. The bottom rectangle sticks out 3 centimeters to the left of the top and is 1 centimeter short of the top on the right. The bottom is 4 centimeters tall. What is the area of the bottom rectangle?

WORK IT OUT HERE

6 IF A LENGTH RECOVERED IN ONE PLACE IS NEEDED ELSEWHERE, THEN WALK IT ACROSS THE FIGURE, ADDING OR SUBTRACTING THE KNOWN OFFSETS BETWEEN RECTANGLES.

Two rectangles form a step shape. The top rectangle has area 72 square centimeters and is 8 centimeters tall. The bottom rectangle sticks out 4 centimeters to the left and is 2 centimeters short of the top on the right. The bottom is 6 centimeters tall. What is the area of the bottom rectangle?

WORK IT OUT HERE

7 IF TWO RECTANGLES HAVE EQUAL AREAS AND SHARE A SIDE, THEN THEIR OTHER SIDES ARE EQUAL TOO.

A rectangle is split by one horizontal cut into a top piece and a bottom piece that share the full width. The top piece has area 12 square centimeters and is 2 centimeters tall. The bottom piece also has area 12 square centimeters. A side rectangle is attached to the right of the whole figure, sharing its full height, and is 9 centimeters wide. What is the area of the side rectangle?

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8 IF TWO RECTANGLES HAVE EQUAL AREAS AND SHARE A SIDE, THEN THEIR OTHER SIDES ARE EQUAL TOO.

Three rectangles are stacked vertically and share the same width. The top has area 12 square centimeters. The bottom has area 12 square centimeters. The whole stack is 11 centimeters tall. A side rectangle attached to the stack has area 30 square centimeters, width 5 centimeters, and shares the stack's full height. What is the area of the middle rectangle?

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9 IF TWO RECTANGLES HAVE EQUAL AREAS AND SHARE A SIDE, THEN THEIR OTHER SIDES ARE EQUAL TOO.

Three rectangles are stacked vertically and share the same width. The top has area 20 square centimeters. The bottom has area 20 square centimeters. The whole stack is 13 centimeters tall. A side rectangle attached to the stack has area 35 square centimeters, width 7 centimeters, and shares the stack's full height. What is the area of the middle rectangle?

WORK IT OUT HERE

10 IF TWO (OR MORE) ADJACENT RECTANGLES SHARE A COMMON SIDE, THEN (SUM OF AREAS) ÷ (SHARED SIDE) = SUM OF THE OTHER SIDES.

Two rectangles sit side by side and share the same height. Their areas are 12 and 18 square centimeters. Together they span 5 centimeters in width. What is the shared height?

WORK IT OUT HERE

11 IF TWO (OR MORE) ADJACENT RECTANGLES SHARE A COMMON SIDE, THEN (SUM OF AREAS) ÷ (SHARED SIDE) = SUM OF THE OTHER SIDES.

Three rectangles sit in a row and share the same height. Their areas are 10, 14, and 18 square centimeters. Together they span 7 centimeters in width. What is the shared height?

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12 IF TWO (OR MORE) ADJACENT RECTANGLES SHARE A COMMON SIDE, THEN (SUM OF AREAS) ÷ (SHARED SIDE) = SUM OF THE OTHER SIDES.

Three rectangles sit in a row at the bottom and share the same height. Their areas, from left to right, are 10, 15, and 20 square centimeters. The three together span 9 centimeters in width. A cap rectangle, 4 centimeters tall, sits on top of the first two bottom rectangles. What is the area of the cap?

WORK IT OUT HERE

13 IF TWO ADJACENT RECTANGLES SHARE A SIDE AND YOU'RE GIVEN THE DIFFERENCE IN THEIR AREAS (AND THE DIFFERENCE IN THEIR OTHER SIDES), THEN SHARED SIDE = (AREA DIFFERENCE) ÷ (SIDE DIFFERENCE).

Three rectangles sit in a row and share the same height. The left rectangle has area 10 square centimeters. The right rectangle has area 18 square centimeters. The left two rectangles together span 6 centimeters in width. The right two rectangles together span 10 centimeters in width. What is the shared height?

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14 IF TWO ADJACENT RECTANGLES SHARE A SIDE AND YOU'RE GIVEN THE DIFFERENCE IN THEIR AREAS (AND THE DIFFERENCE IN THEIR OTHER SIDES), THEN SHARED SIDE = (AREA DIFFERENCE) ÷ (SIDE DIFFERENCE).

Three rectangles sit in a row and share the same height. The left rectangle has area 15 square centimeters. The right rectangle has area 27 square centimeters. The left two rectangles together span 8 centimeters in width. The right two rectangles together span 12 centimeters in width. What is the shared height?

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15 IF TWO ADJACENT RECTANGLES SHARE A SIDE AND YOU'RE GIVEN THE DIFFERENCE IN THEIR AREAS (AND THE DIFFERENCE IN THEIR OTHER SIDES), THEN SHARED SIDE = (AREA DIFFERENCE) ÷ (SIDE DIFFERENCE).

Three rectangles sit in a row and share the same height. The left rectangle has area 12 square centimeters. The right rectangle has area 36 square centimeters. The left two rectangles together span 7 centimeters in width. The right two rectangles together span 13 centimeters in width. What is the area of the middle rectangle?

WORK IT OUT HERE

16 PICK THE RIGHT PRINCIPLE AT EACH STEP — L0–L4 ARE THE TOOLBOX, AND L5 PUZZLES NEED 2–3 CHAINED CORRECTLY.

A figure has three rectangles. Rectangle A has area 12 square centimeters and is 3 centimeters wide. Rectangle B sits directly to the right of A, sharing a vertical wall with A, and has area 20 square centimeters. Rectangle C sits on top of B, sharing B's full width, and is 6 centimeters tall. What is the area of rectangle C?

WORK IT OUT HERE

17 PICK THE RIGHT PRINCIPLE AT EACH STEP — L0–L4 ARE THE TOOLBOX, AND L5 PUZZLES NEED 2–3 CHAINED CORRECTLY.

Two rectangles sit in a row and share the same height. The left rectangle has area 18 square centimeters. The right rectangle has area 30 square centimeters. Together they span 8 centimeters in width. A cap rectangle sits on top of the right rectangle only, sharing its width, and the cap is 7 centimeters tall. What is the area of the cap?

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18 PICK THE RIGHT PRINCIPLE AT EACH STEP — L0–L4 ARE THE TOOLBOX, AND L5 PUZZLES NEED 2–3 CHAINED CORRECTLY.

A mural has three rectangles in a row that share the same height. The left rectangle has area 12 square centimeters. The right rectangle has area 30 square centimeters. The left two rectangles together span 8 centimeters in width. The right two rectangles together span 14 centimeters in width. A cap rectangle sits on top of the middle rectangle only, sharing its width, and the cap is 5 centimeters tall. What is the area of the cap?

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Answer Key

Each answer comes with a hint that names the move. The tag says which video to rewatch if you are stuck.

1. 20 square centimeters — *If two rectangles share a wall AND one rectangle's area + that-side is known, then that side's length = area ÷ side; the SHARED wall is the same in both.*

Use the left rectangle's area and width to recover the wall's height, then trade that height into the right rectangle.

2. 30 square centimeters — *If two rectangles share a wall AND one rectangle's area + that-side is known, then that side's length = area ÷ side; the SHARED wall is the same in both.*

Divide the left area by its width to get the shared wall, then multiply by the right rectangle's width.

3. 56 square centimeters — *If two rectangles share a wall AND one rectangle's area + that-side is known, then that side's length = area ÷ side; the SHARED wall is the same in both.*

Recover the shared wall's length from the left rectangle, then carry it across to the right.

4. 24 square centimeters — *If a length recovered in one place is needed elsewhere, then walk it across the figure, adding or subtracting the known offsets between rectangles.*

Recover the top rectangle's width, add the right overhang, then multiply by the bottom's height.

5. 40 square centimeters — *If a length recovered in one place is needed elsewhere, then walk it across the figure, adding or subtracting the known offsets between rectangles.*

Get the top width, add the left overhang, subtract the right underhang, then multiply by the bottom's height.

6. 66 square centimeters — *If a length recovered in one place is needed elsewhere, then walk it across the figure, adding or subtracting the known offsets between rectangles.*

Carry the recovered top width down, adjust by the offsets, then multiply by the bottom height.

7. 36 square centimeters — *If two rectangles have EQUAL areas AND share a side, then their OTHER sides are equal too.*

Use the top piece to recover the shared width, then apply Equal Areas, Equal Sides to the bottom to get the stack's full height.

8. 42 square centimeters — *If two rectangles have EQUAL areas AND share a side, then their OTHER sides are equal too.*

Use the side rectangle to recover the shared width, then notice the top and bottom must share a height; subtract their combined height from the stack to get what's left for the middle.

9. 25 square centimeters — *If two rectangles have EQUAL areas AND share a side, then their OTHER sides are equal too.*

Find the shared width from the side rectangle, equal top and bottom areas force equal heights, the middle gets the leftover.

10. **6 centimeters** — *If two (or more) adjacent rectangles share a common side, then (sum of areas) ÷ (shared side) = sum of the other sides.*

Group the two areas into one big rectangle, then divide by the combined width.

11. **6 centimeters** — *If two (or more) adjacent rectangles share a common side, then (sum of areas) ÷ (shared side) = sum of the other sides.*

Sum the three areas and divide by the total width to get the shared height.

12. **20 square centimeters** — *If two (or more) adjacent rectangles share a common side, then (sum of areas) ÷ (shared side) = sum of the other sides.*

Group all three to get the shared height, regroup the first two to get the cap's width, then multiply by the cap's height.

13. **2 centimeters** — *If two adjacent rectangles share a side AND you're given the DIFFERENCE in their areas (and the difference in their other sides), then shared side = (area difference) ÷ (side difference).*

Subtract the two given spans and the two given areas; the middle column cancels and leaves the height.

14. **3 centimeters** — *If two adjacent rectangles share a side AND you're given the DIFFERENCE in their areas (and the difference in their other sides), then shared side = (area difference) ÷ (side difference).*

Subtract the spans, subtract the areas, and divide — the unknown middle width cancels.

15. **16 square centimeters** — *If two adjacent rectangles share a side AND you're given the DIFFERENCE in their areas (and the difference in their other sides), then shared side = (area difference) ÷ (side difference).*

First cancel the unknown to get the height, then use the left area to find the left width and subtract from the left span.

16. **30 square centimeters** — *Pick the right principle at each step — L0–L4 are the toolbox, and L5 puzzles need 2–3 chained correctly.*

Recover A's height first, use that to find B's width, then multiply B's width by C's height.

17. **35 square centimeters** — *Pick the right principle at each step — L0–L4 are the toolbox, and L5 puzzles need 2–3 chained correctly.*

Group the two row areas and divide by the combined width to get the shared height, then trade that height into the right rectangle to recover its width, and multiply by the cap's height.

18. **20 square centimeters** — *Pick the right principle at each step — L0–L4 are the toolbox, and L5 puzzles need 2–3 chained correctly.*

First cancel the unknown to get the row's height, then use the left area to recover the left width, then subtract to get the middle width and multiply by the cap's height.