Midpoint, Meeting in the Middle

The midpoint is halfway along a segment: average the x's and average the y's. Backward: from the midpoint and one endpoint, take the step once more, or set the average equal and solve.

1 THE VOCABULARY
Words we use

Midpoint exactly halfway along a segment; it bisects it.
Endpoint a point at either end.
Mean (average) add and divide by how many; for two, divide by 2.
1 to 1 ratio the two halves are equal.
Step way the step from the endpoint to the midpoint, taken once more.

- Watch out for these.
- Subtracting instead of adding when averaging.
- Forgetting to divide by 2.
- In the equation way, forgetting to multiply both sides by 2 first.
- Taking the step from the midpoint back toward the known endpoint.

2 THE METHOD
Midpoint, and backward

1. ACROSS add the x's, divide by 2.
2. UP add the y's, divide by 2.
3. BACKWARD, STEP WAY endpoint to midpoint is a step; take it once more from the midpoint.
4. BACKWARD, EQUATION WAY set each average equal to the midpoint's coordinate; multiply by 2, then subtract.
5. CHECK the midpoint of the two endpoints should come out right.

WHY AN AVERAGE
Halfway between two numbers is their mean. The grid is two number lines at once, so average across and average up.

3 JENNIFER AND JANE
(9, 7) and (15, 9)

9 + 152 = 12	halfway across
7 + 92 = 8	halfway up
M = (12, 8)	they meet here
from (15, 9) instead: the same	order does not matter
by counting: 6 across and 2 up, so 3 and 1	the picture behind the formula

MISSING ENDPOINT
M(6, 2), A(1, 3): step 5 right, 1 down, once more: (11, 1). Equation way: 1 + x2 = 6 gives x = 11.

SAY IT OUT LOUD
Halfway across, halfway up: average the x's, average the y's. Backward: take the step once more.