Reasoning and Problem Solving
Step 3: Move on a Grid

National Curriculum Objectives:

Mathematics Year 4: (4P2) Describe movements between positions as translations of a given unit to the left/right and up/down
Mathematics Year 4: (4P3a) Describe positions on a 2D grid as coordinates in the first quadrant

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing One-step translation of a specified point to create the vertices of a 3 or 4 sided polygon on a 5x5 grid.
Expected Two-step translation of an unspecified point to create the vertices of a 4 sided polygon on a 10x10 grid.
Greater Depth Two-step translation of two unspecified points to create the vertices of a 4 sided polygon on a 10x10 grid with varying scales. Several possibilities.

Questions 2, 5 and 8 (Problem Solving)
Developing Identify new coordinates based on given one-step translation, using a 1:1 scale. Find two possible answers.
Expected Identify new coordinates based on given two-step translation, using a 1:1 scale. Find two possible answers.
Greater Depth Identify new coordinates based on given two-step translation, using varying scales and points between increments. Find two possible answers.

Questions 3, 6 and 9 (Reasoning)
Developing Identify the original coordinates of a point translated in one-step on a 5x5 grid with a 1:1 scale.
Expected Identify the original coordinates of a point translated in two steps on a 10x10 grid with a 1:1 scale.
**Greater Depth** Identify the original coordinate of a point translated in two steps on a 10x10 grid with varying scales and points between increments.

More Year 4 Position and Direction resources.

Did you like this resource? Don't forget to review it on our website.

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Move on a Grid	Move on a Grid

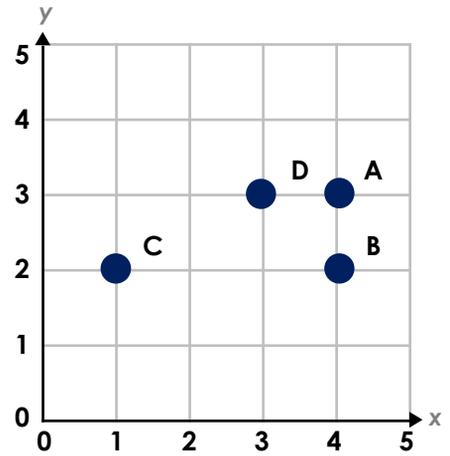**1a.** Move point A to create the vertices for a right-angled triangle. Record the new coordinates.
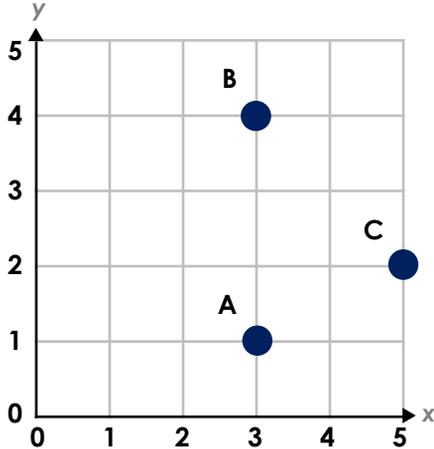
1b. Move point C to create the vertices for a square. Record the new coordinates.

2a. A point was placed on the following coordinates:

(2, 5)

The point was then moved 2 squares.

What could the new coordinates be? Find 2 possibilities.

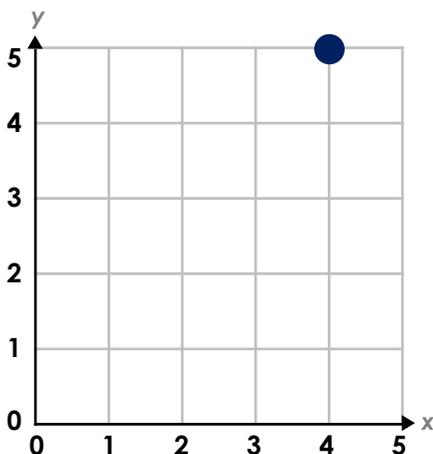**2b.** A point is placed on the following coordinates:

(5, 4)

The point was moved 4 squares.
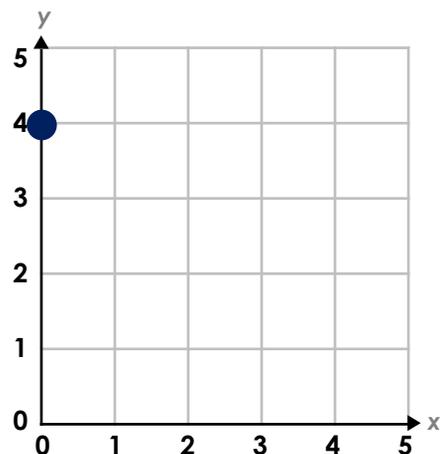
What could the new coordinates be? Find 2 possibilities.

3a. The point was moved 5 up. Ahmed thinks the original coordinates were (4, 0). Is he correct? Prove it.


3b. The point was moved 3 left. Sophia thinks the original coordinates were (4, 4). Is she correct? Prove it.
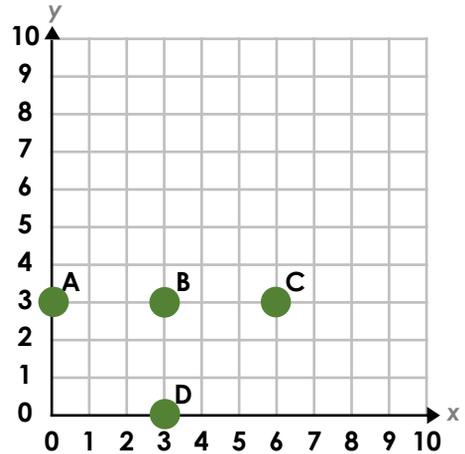
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Reasoning and Problem Solving – Move on a Grid – Year 4 Developing

4a. Move one point to create the vertices for a square. Record the new coordinates.

y

10
9
8
7
6 B ●   C ●
5
4
3
2 A ●
1   D ●
0
  0 1 2 3 4 5 6 7 8 9 10 *x*

PS

4b. Move one point to create the vertices for a square. Record the new coordinates.

y

10
9
8
7
6
5
4
3 A ●   B ●   C ●
2
1
0   D ●
  0 1 2 3 4 5 6 7 8 9 10 *x*
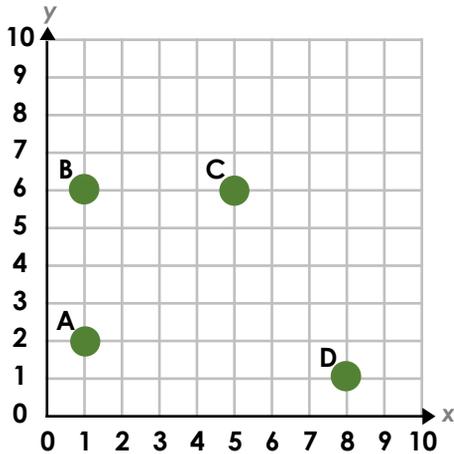
PS

5a. Points are placed on the following coordinates:

$(7, 5)$ $(4, 7)$ $(1, 4)$

Each of the points have been moved 1 square in one direction and 3 squares in another.

What could the new coordinates be? Find 2 possibilities.

PS

5b. Points are placed on the following coordinates:
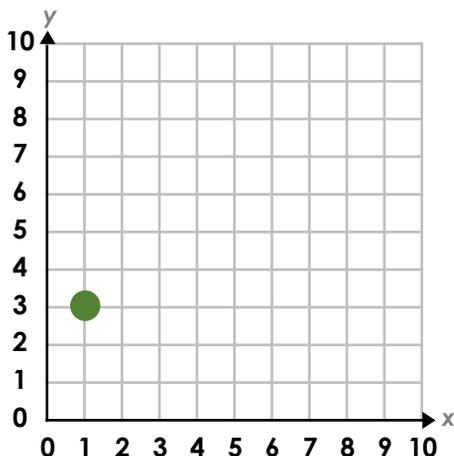
$(5, 8)$ $(7, 4)$ $(6, 7)$

Each of the points have been moved 2 square in one direction and 2 squares in another.

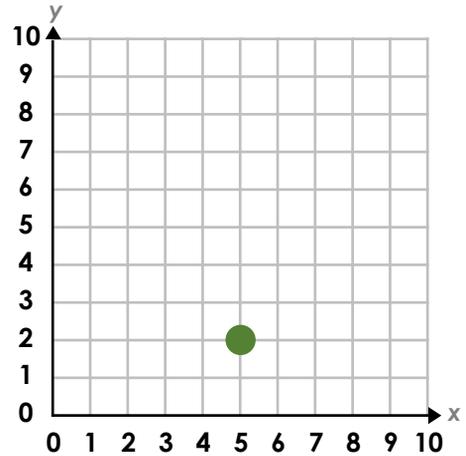What could the new coordinates be? Find 2 possibilities.

PS

6a. The point was moved 3 left and 2 up. Ben thinks the original coordinates were (4, 1). Is he correct? Prove it.

y

10
9
8
7
6
5
4
3 ●
2
1
0
  0 1 2 3 4 5 6 7 8 9 10 *x*

R

6b. The point was moved 5 right and 1 up. Eve thinks the original coordinates were (1, 1). Is she correct? Prove it.

y

10
9
8
7
6
5
4
3
2   ●
1
0
  0 1 2 3 4 5 6 7 8 9 10 *x*

R

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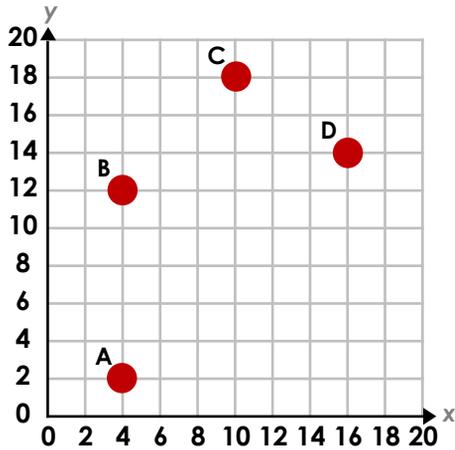**Reasoning and Problem Solving – Move on a Grid – Year 4 Expected**
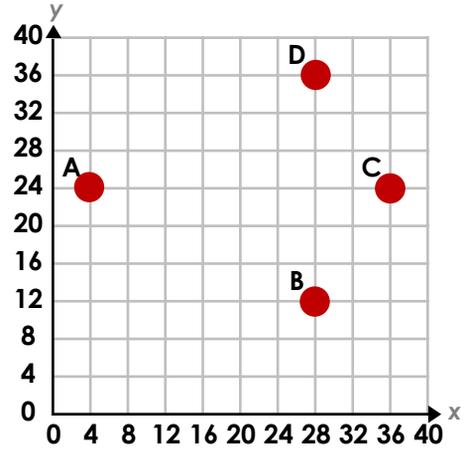
Move on a Grid

Move on a Grid

7a. Move two points to create the vertices for a square. Record the new coordinates. Find two possibilities.

7b. Move two points to create the vertices for a rectangle. Record the new coordinates. Find two possibilities.

8a. Points are placed on the following coordinates:

(6, 8) (8, 16) (10, 10) (14, 12)

Each of the points have been moved 6 in one direction and 8 in another.

What could the new coordinates be? Find 2 possibilities.

8b. Points are placed on the following coordinates:

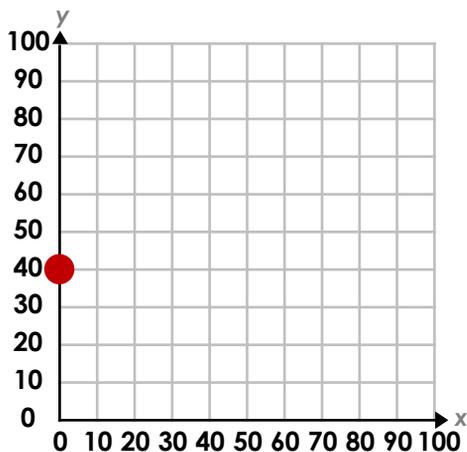(40, 65) (60, 30) (50, 55) (70, 70)

Each of the points have been moved 20 in one direction and 30 in another.
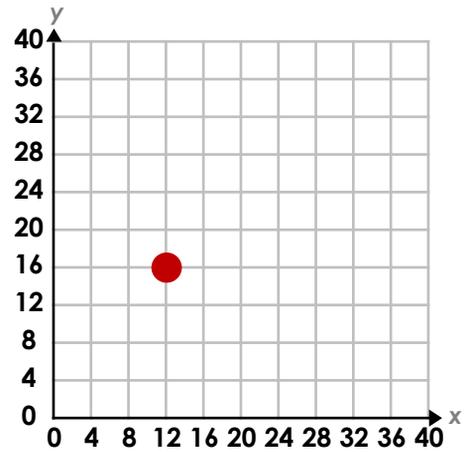
What could the new coordinates be? Find 2 possibilities.

9a. The point was moved 40 left and 20 down. The original coordinates of the point were (40, 60). Is this correct? Prove it.

9b. The point was moved 2 right and 4 up. The original coordinates of the point were (4, 0). Is this correct? Prove it.

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Reasoning and Problem Solving – Move on a Grid – Year 4 Greater Depth

Reasoning and Problem Solving
Move on a Grid

Developing
1a. (3, 2) or (3, 0)
2a. (0, 5), (2, 3) or (4, 5)
3a. Ahmed is correct. The new coordinates are (4, 5) which is 5 up from (4, 0).

Expected
4a. D = (5, 2)
5a. Various answers, for example: (6, 2), (3, 4), (0, 1) or (8, 8), (5, 10), (2, 7)
6a. Ben is correct. The new coordinates are (4, 5) which is 5 up from (4, 0).

Greater Depth
7a. Various answers, for example:
C = (14, 2) and D = (14, 12) or
A = (10, 6) and D = (16, 12)
8a. Various answers, for example:
(0, 0), (2, 8), (4, 2), (8, 4) or (12, 0), (14, 8), (16, 2), (20, 4)
9a. Correct. The new coordinates are (0, 40) which is 40 left 20 down from (40, 60).

Reasoning and Problem Solving
Move on a Grid

Developing
1b. (3, 2)
2b. (1, 4) or (5, 0)
3b. Sophia is incorrect. The original coordinates were (3, 4) which is 3 left from (0, 4).

Expected
4b. C = (0, 0) or A = (6, 0)
5b. Various answers, for example: (3, 6), (5, 2), (4, 5) or (7, 10), (9, 6), (8, 9)
6b. Eve is incorrect. The original coordinates were (0, 1) which is 5 right and 1 up from (5, 2).

Greater Depth
7b. Various answers, for example:
B = (4, 12) and D = (36, 12) or
A = (8, 36) and C = (8, 12)
8b. Various answers, for example:
(20, 35), (40, 0), (30, 25), (50, 40) or (60, 95), (80, 60), (70, 85), (90, 100)
9b. Incorrect. The original coordinates were (10, 12) which is 2 right and 4 up from (12, 16).