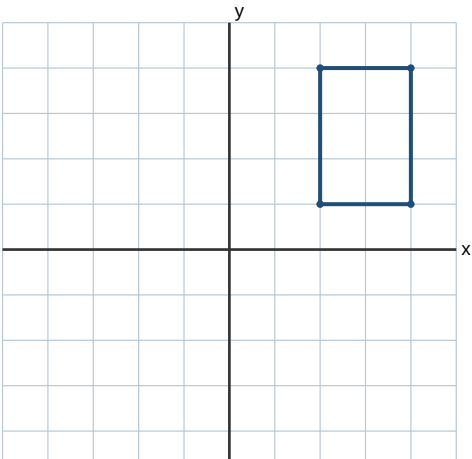


GRADE 7

COORDINATES & TRANSFORMATIONS

Complete Printable Worksheet Pack



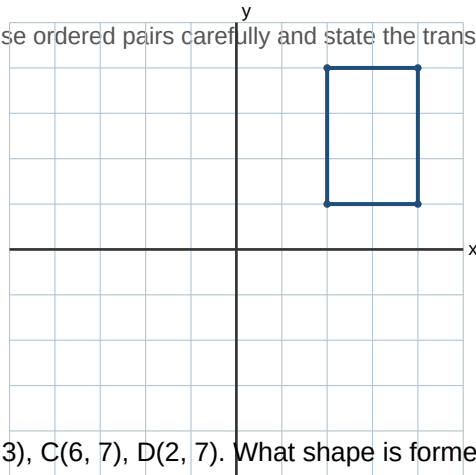
Coordinate grid
Plot points, read coordinates
and apply transformations

6 Worksheets	Separate Answer Keys
Coordinate Planes	Translations & Reflections
Rotations	Multi-Step Challenges

A4 printable • International Grade 7 level

Worksheet 1: Coordinate Planes & Plotting

Show your working. Use ordered pairs carefully and state the transformation clearly.



Coordinate grid

Plot points, read coordinates
and apply transformations

1. Plot $A(2, 3)$, $B(6, 3)$, $C(6, 7)$, $D(2, 7)$. What shape is formed?
2. State the quadrant containing each point: $P(-4, 5)$, $Q(3, -6)$, $R(-2, -7)$, $S(5, 4)$.
3. Which axis contains each point: $A(0, 6)$, $B(-5, 0)$, $C(0, -3)$?
4. Plot the points $(-3, 2)$, $(1, 2)$, $(1, -2)$, $(-3, -2)$. Find the side lengths and area of the shape.
5. Point M is $(4, -1)$. Move it 5 units left and 3 units up. Give the new coordinates.
6. Point N is $(-2, 6)$. Move it 4 units right and 8 units down. Give the new coordinates.
7. Which point is farther from the y -axis: $A(-7, 2)$ or $B(4, 9)$? Explain.
8. A rectangle has vertices $(-5, -2)$, $(3, -2)$, $(3, 4)$ and $(-5, 4)$. Find its perimeter and area.
9. A point has x -coordinate -6 and lies on the horizontal line $y=5$. Write its coordinates.
10. Describe how the coordinates change when a point moves 3 units right and 4 units down.

Answer Key 1: Coordinate Planes & Plotting

Equivalent correct methods are acceptable.

1. Square, side 4 units.
2. P Quadrant II; Q Quadrant IV; R Quadrant III; S Quadrant I.
3. A on y-axis; B on x-axis; C on y-axis.
4. Rectangle 4×4 ; side 4 units; area 16 square units.
5. $(-1, 2)$
6. $(2, -2)$
7. A; distance from y-axis is 7 units versus 4.
8. Width 8, height 6; perimeter 28 units; area 48 square units.
9. $(-6, 5)$
10. Add 3 to x and subtract 4 from y: $(x,y) \rightarrow (x+3,y-4)$.

Worksheet 2: Reading & Using Coordinates

Show your working. Use ordered pairs carefully and state the transformation clearly.

1. A point T is $(-4, -3)$. What are its x- and y-coordinates?
2. Which point is closest to the origin: A(2, 2), B(-1, 4), C(-3, 1)?
3. Which points are on the same horizontal line: P(-5, 3), Q(2, 3), R(2, -4), S(-5, -4)?
4. Find the midpoint of the horizontal segment joining $(-6, 4)$ and $(8, 4)$.
5. Find the midpoint of the vertical segment joining $(3, -5)$ and $(3, 7)$.
6. Which point is closest to the origin: A(2, 2), B(-3, 1), C(-1, -2)? Use squared distance to compare.
7. Points A(-2, 5) and B(4, 5) are joined. Find the horizontal distance AB.
8. Points C(-3, -1) and D(-3, 6) are joined. Find the vertical distance CD.
9. A point lies 5 units left of the y-axis and 7 units below the x-axis. Write its coordinates.
10. The vertices of a rectangle are $(-4, 1)$, $(5, 1)$, $(5, 6)$, $(-4, 6)$. Find its width, height and area.

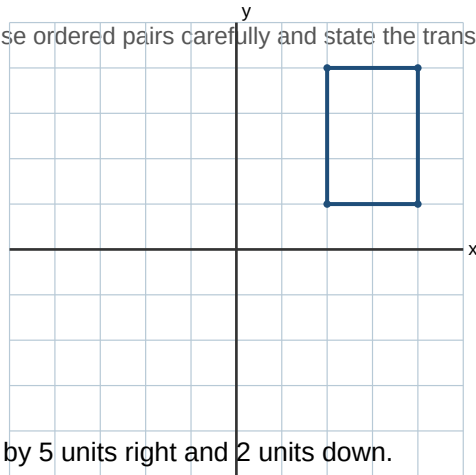
Answer Key 2: Reading & Using Coordinates

Equivalent correct methods are acceptable.

1. $x=-4$, $y=-3$
2. C; squared distances 8,17,10.
3. P and Q share $y=3$; R and S share $y=-4$.
4. (1,4)
5. (3,1)
6. C; squared distance 5, compared with 8 and 10.
7. 6 units
8. 7 units
9. $(-5,-7)$
10. Width 9, height 5, area 45 square units.

Worksheet 3: Translations

Show your working. Use ordered pairs carefully and state the transformation clearly.



Coordinate grid

Plot points, read coordinates
and apply transformations

1. Translate $A(2, 4)$ by 5 units right and 2 units down.
2. Translate $B(-3, 1)$ by 4 units left and 6 units up.
3. A point $(7, -2)$ is translated to $(1, 5)$. Describe the translation.
4. Triangle vertices are $A(1,2)$, $B(5,2)$, $C(3,6)$. Translate the triangle 3 units left and 4 units down. Give all new coordinates.
5. A rectangle has vertices $(-2,-1)$, $(4,-1)$, $(4,3)$, $(-2,3)$. Translate it 5 units right. Give the new vertices.
6. Point P is $(-6,4)$. After a translation it becomes $(2,-3)$. State the translation vector.
7. A point is translated by vector $(-7, +5)$. What happens to x and y ?
8. A triangle has vertices $(-4,-2)$, $(0,-2)$, $(-2,3)$. It is translated by $(6,1)$. Find the new vertices.
9. If point (x,y) is translated 8 units left and 3 units up, write the rule.
10. Explain why a translation changes position but not the size or shape of a figure.

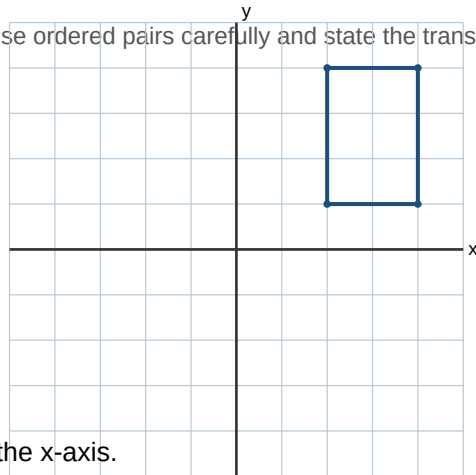
Answer Key 3: Translations

Equivalent correct methods are acceptable.

1. $(7,2)$
2. $(-7,7)$
3. 6 units left and 7 units up; vector $(-6,+7)$.
4. $A'(-2,-2)$, $B'(2,-2)$, $C'(0,2)$.
5. $(3,-1)$, $(9,-1)$, $(9,3)$, $(3,3)$.
6. $(+8, -7)$
7. x decreases by 7; y increases by 5.
8. $(2,-1)$, $(6,-1)$, $(4,4)$.
9. $(x,y) \rightarrow (x-8,y+3)$.
10. Every point moves the same distance and direction, so lengths and angles are preserved.

Worksheet 4: Reflections

Show your working. Use ordered pairs carefully and state the transformation clearly.



Coordinate grid

Plot points, read coordinates
and apply transformations

1. Reflect $A(4,3)$ in the x-axis.
2. Reflect $B(-5,2)$ in the y-axis.
3. Reflect $C(-3,-6)$ in the x-axis.
4. Reflect $D(7,-4)$ in the y-axis.
5. Write the coordinate rule for reflection in the x-axis.
6. Write the coordinate rule for reflection in the y-axis.
7. A triangle has vertices $(1,2)$, $(5,2)$, $(3,6)$. Reflect it in the x-axis. Give the new vertices.
8. Reflect point $(-2,4)$ in the y-axis, then translate it 3 units down.
9. A point $(6,-5)$ is reflected in the origin. What are its new coordinates?
10. Explain one way to check that a point and its reflection are the same distance from the mirror line.

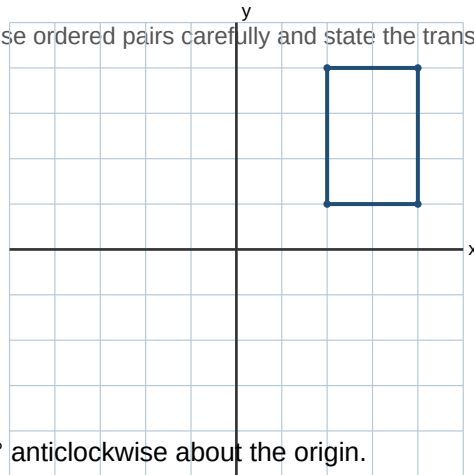
Answer Key 4: Reflections

Equivalent correct methods are acceptable.

1. $(4,-3)$
2. $(5,2)$
3. $(-3,6)$
4. $(-7,-4)$
5. $(x,y) \rightarrow (x,-y)$
6. $(x,y) \rightarrow (-x,y)$
7. $(1,-2), (5,-2), (3,-6)$
8. $(2,1)$
9. $(-6,5)$
10. Compare their perpendicular distances to the mirror line; the distances should be equal.

Worksheet 5: Rotations

Show your working. Use ordered pairs carefully and state the transformation clearly.



Coordinate grid

Plot points, read coordinates
and apply transformations

1. Rotate $A(3,2)$ 90° anticlockwise about the origin.
2. Rotate $B(-4,1)$ 90° clockwise about the origin.
3. Rotate $C(5,-2)$ 180° about the origin.
4. State the coordinate rule for a 90° anticlockwise rotation about the origin.
5. State the coordinate rule for a 90° clockwise rotation about the origin.
6. A triangle has vertices $(1,2)$, $(4,2)$, $(1,5)$. Rotate it 180° about the origin.
7. Point $P(-3,4)$ is rotated 90° anticlockwise. Give its new coordinates and quadrant.
8. Point $Q(-2,4)$ is rotated 90° anticlockwise. Give its new coordinates and quadrant.
9. Point $R(6,-1)$ is rotated 180° and then translated 2 units up. Give its final coordinates.
10. Explain why rotation preserves the lengths of the sides of a shape.

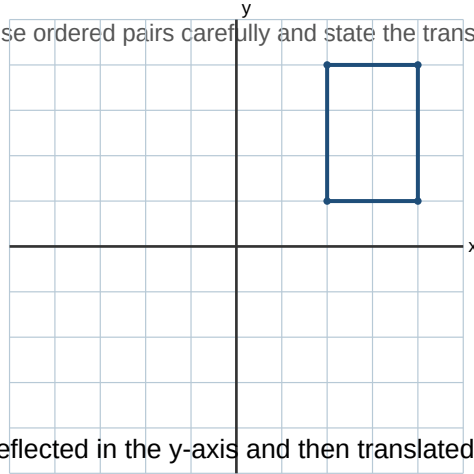
Answer Key 5: Rotations

Equivalent correct methods are acceptable.

1. $(-2,3)$
2. $(1,4)$
3. $(-5,2)$
4. $(x,y) \rightarrow (-y,x)$
5. $(x,y) \rightarrow (y,-x)$
6. $(-1,-2), (-4,-2), (-1,-5)$
7. $(-4,-3)$, Quadrant III
8. $(-4,-2)$, Quadrant III
9. $(-6,3)$
10. Rotation moves every point the same angular amount around the centre, preserving distances.

Worksheet 6: Coordinates & Transformations Challenge

Show your working. Use ordered pairs carefully and state the transformation clearly.



Coordinate grid

Plot points, read coordinates
and apply transformations

1. Point $A(-3, 5)$ is reflected in the y -axis and then translated 2 units down. Find A' .
2. A point $(4, -6)$ is translated 7 units left and 3 units up, then reflected in the x -axis. Find its final coordinates.
3. Triangle vertices are $(-2, 1)$, $(2, 1)$, $(0, 5)$. Translate by $(3, -2)$, then reflect in the y -axis. Give all final coordinates.
4. Point $P(5, -2)$ is rotated 90° clockwise about the origin and then translated 4 units left. Find its final coordinates.
5. A rectangle has vertices $(-4, -3)$, $(2, -3)$, $(2, 1)$, $(-4, 1)$. Reflect it in the y -axis. What are the new vertices and area?
6. Point $Q(-5, 2)$ maps to $Q'(5, -2)$. Name one single rotation about the origin that produces this image.
7. A point (x, y) is reflected in the x -axis and then translated 5 units right. Write the combined rule.
8. Point $(-2, 3)$ is reflected in the x -axis and then rotated 180° about the origin. Find the final coordinates.
9. A triangle is translated 6 units right and 4 units down. Its original centroid is $(-2, 5)$. Find the new centroid.
10. Explain why translations, reflections and rotations are called rigid transformations.

Answer Key 6: Coordinates & Transformations Challenge

Equivalent correct methods are acceptable.

1. (3,3)
2. (-3,3)
3. First (1,-1),(5,-1),(3,3); final (-1,-1),(-5,-1),(-3,3).
4. (-2,-5)
5. (4,-3),(-2,-3),(-2,1),(4,1); area 24 square units.
6. 180° rotation about the origin.
7. $(x,y) \rightarrow (x+5,-y)$.
8. (2,3)
9. (4,1)
10. They preserve lengths and angles, so the size and shape of the figure do not change.