

7. Transformations and vectors

Starter Quiz · 课前小测

IGCSE Mathematics

Name: _____ Score: _____

1. Reflect the point $(3, 2)$ in the y-axis. The image is $(a, 2)$. What is a ?

2. $a = (3, 1)$ and $b = (2, -4)$. The top number of $a + b$ is?

3. If a and b are the position vectors of A and B, then the vector AB is:

☐ $b - a$

☐ $a - b$

☐ $a + b$

☐ $\frac{1}{2}(a + b)$

4. Translate $(5, 3)$ by the vector $(-2, 4)$. The image is $(3, b)$. What is b ?

5. $a = (3, 1)$ and $b = (2, -4)$. The bottom number of $a + b$ is?

6. M is the midpoint of AB. The position vector OM is:

☐ $\frac{1}{2}(a + b)$

☐ $a + b$

☐ $b - a$

☐ $\frac{1}{2}(b - a)$

7. Which transformation changes the size of a shape?

☐ enlargement

☐ reflection

☐ rotation

☐ translation

8. Find the magnitude (length) of the vector $(3, 4)$.

9. Two vectors are parallel if one is a scalar multiple of the other.

☐ True ☐ False

10. The magnitude of the vector $(3, 4)$ is $3 + 4 = 7$.

☐ True ☐ False

1. **-3**

Reflecting in the y-axis flips the sign of x: $a = -3$.

2. **5**

$$3 + 2 = 5.$$

3. **$b - a$**

$$AB = (\text{position of B}) - (\text{position of A}) = b - a.$$

4. **7**

Move 4 up: $3 + 4 = 7$.

5. **-3**

$$1 + (-4) = -3.$$

6. **$\frac{1}{2}(a + b)$**

$$OM = a + \frac{1}{2}(b - a) = \frac{1}{2}(a + b).$$

7. **enlargement**

Only enlargement changes size; the other three keep it congruent.

8. **5**

$$\sqrt{(3^2 + 4^2)} = \sqrt{25} = 5.$$

9. **True**

Parallel vectors point the same (or opposite) way, so one is k times the other.

10. **False**

Magnitude uses Pythagoras: $\sqrt{(3^2 + 4^2)} = 5$, not the sum $3 + 4 = 7$.