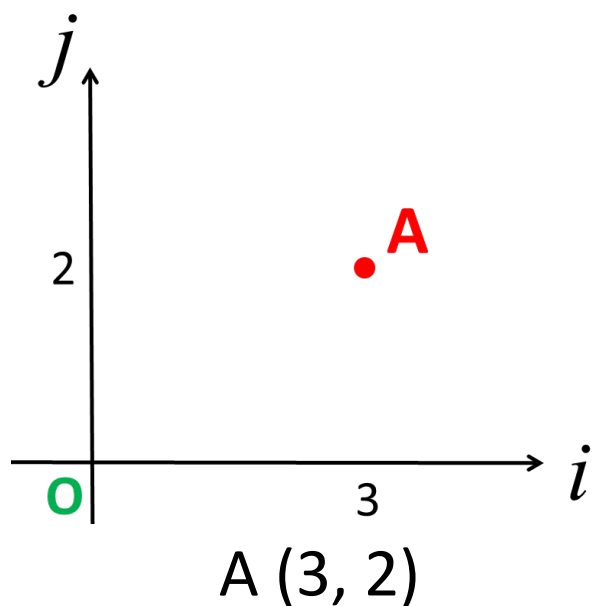


Year 2 Pure Chapter 12 - Vectors

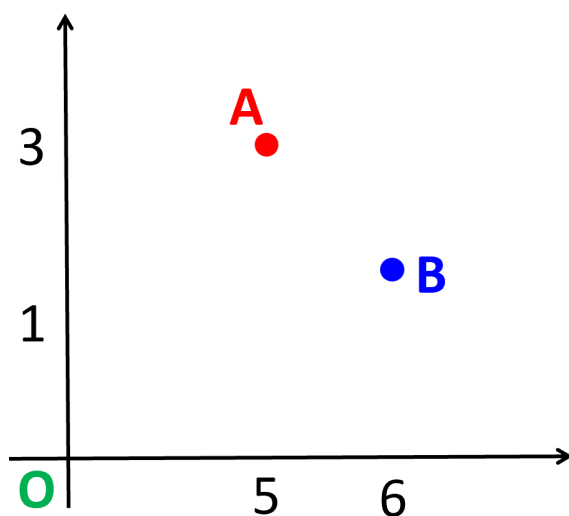
Describing Co-ordinates



or

$$OA = 3i + 2j$$

Describing Line Segments



$$AB = AO + OB$$

Magnitude

2D Vector

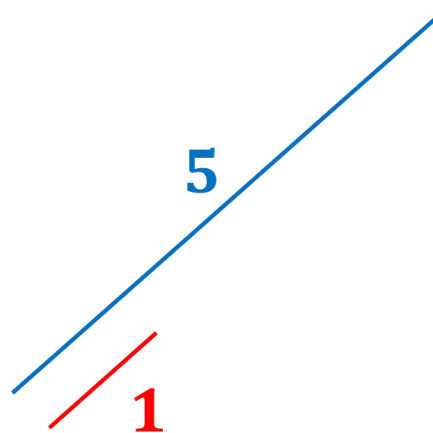
$$|a| = \sqrt{i^2 + j^2}$$

3D Vector

$$|a| = \sqrt{i^2 + j^2 + k^2}$$

Unit Vector

A unit vector has a length of 1.



$$a = 3i + 4j$$

$$\text{Unit Vector} = \frac{1}{5}(3i + 4j)$$

$$\text{Unit Vector} = \frac{1}{|a|}(a)$$

Vectors and Parallel

Vectors are parallel if one is a multiple of the other.

$$a = 3i + 4j + 5k$$

$$b = 6i + 8j + 10k \\ = 2(3i + 4j + 5k)$$

$$2a = b$$

b is a multiple of a
 $\therefore$ parallel

Geometric Problems

Show a triangle is a isosceles:

Show only 2 magnitudes are the same.

Show a triangle is a equilateral:

Show only 2 magnitudes are the same.

Show a quadrilateral:

Parallel Sides and Equal Sides

Mechanics

To find the **Resultant Force** add all forces.

$$F = ma$$

F is a vector

a is a vector

m is a scale
