SAME LINE, THREE WAYS

Two vectors are parallel when one is a scalar multiple of the other: $\mathbf{a} = c\mathbf{b}$. The value of c says how they lie along that line.

PARALLEL VECTORS

$$\mathbf{a} = c\mathbf{b}$$

split by **the scalar c**

+

CASE 1

$c > 0$

Same direction

parallel in the strict sense

−

CASE 2

$c < 0$

Opposite directions

anti-parallel

0

CASE 3

$c = 0$

The zero vector

by convention $\mathbf{0} = 0\mathbf{b}$ is parallel to every vector

TAKEAWAY

For a pair of vectors, being parallel and being linearly dependent are the same thing.