Vector Notes

Negative vectors: A negative vector has the same length but is pointed in the opposite direction of vector v.

V

-V

(Scalar) Multiplication – A scalar multiple of a vector changes its length by a factor, but the direction does not change.

0.5 V

2V

V

Vector subtraction

Given vectors u and v, then u – v = u + (-v)

U

2.5 m

v

1 m

Find u – v :

A2 + b2 = r2

12 + 2.52 =

Component Vectors:

Any vector can be broken into two component vectors: one horizontal and one vertical.

Example:

500

8 m/s

Vertical

Horizontal

Horizontal component vector
Cos 500 = horizontal / 8m/s

Horizontal = (8m/s)(cos500) = 5.14 m/s

Vertical Component vector
sin500 = vertical / 8m/s

Vertical = (8m/s)(sin500) = 6.13m/s

Example:

Vertical

13 m/s

660

Horizontal

Horizontal:

Cos 660 = vertical /13 m/s

Vertical:

Sin 660 = horizontal / 13 m/s