

PHYSICS AND CALCULUS

POSITION
 $s(t)$

The location of the object with respect to time.

$s(t) > 0$ object is above or to the right of initial position.
 $s(t) < 0$ object is below or to the left of initial position.
 $s(t) = 0$ object is on ground level

VELOCITY
 $v(t) = s'(t)$

The direction and magnitude the object is moving with respect to time.
{1st derivative of $s(t)$ }

$v(t) > 0$ object is moving right or up.
 $v(t) < 0$ object is moving left or down.
 $v(t) = 0$ object is at rest.

ACCELERATION
 $a(t) = v'(t) = s''(t)$

The direction and magnitude of the rate of change of an objects velocity with respect to time.
{2nd derivative of $s(t)$ }

$a(t) > 0$ acceleration is right or up
 $a(t) < 0$ acceleration is left or down
 $a(t) = 0$ object has no acceleration; no change in velocity;

SPEED
 $|v(t)|$

How fast an object is moving regardless of direction.

This is just the absolute value of velocity at a specific time.