OF SEVERAL PARTICLES

RELATIVE MOTION

$v_{A/B}=v_A-v_B$

$v_{B/A}=v_B-v_A$

In relative motion, at the time when two bodies hit, they have the same position both **relative to the same origin**.:

$(x_A, y_A)=(x_B, y_B)$

DEPENDENT MOTION

The major method in solving this is the constant string length

In dependent motion:

take note of the direction of movement of the bodies for each;

take a reference axis at the center of the pulley connected to the body. The axis should be perpendicular to the direction of movement of the body.

When any of the bodies move, the length of the string remains constant; however, the distance from these reference points to the bodies or to other reference points will change

We don’t necessarily need to measure from a reference point to the body. We can measure from the reference point to another reference point. This is allowed because, the part that will be omitted will always be constant.

So when calculating the length we can omit the constant parts because on differentiating a constant we will get 0.

So the length, l – which is constant – will be given as:

l

These motions have directions; and the positive direction should always point in the direction of the moving body

So when body B moves down, on differentiating we get the velocity (relationships)

Differentiating again, we get the acceleration