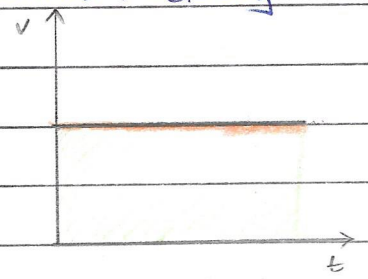
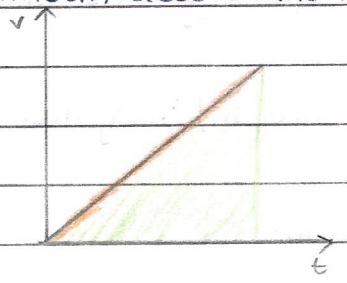
Accelerated motion

Q-1) Velocity & time graphs.

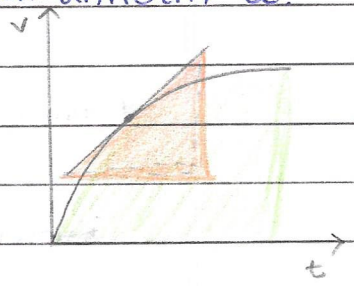
Uniform velocity



Uniform acceleration



Non-uniform a.



area = distance.

gradient = acceleration.

*. draw tangent at that point to find a.

Q-2) Deriving equations of motion.

① $a = \frac{v-u}{t}$

$v - u = at$

$v = u + at$

② $s = \frac{1}{2}(v+u)t$

$s = \frac{1}{2}(u + at + u)t$ —o $v = u + at$

$s = \frac{1}{2}(2u + at)t$

$s = ut + \frac{1}{2}at^2$

③ $v = u + at$

$v^2 = (u + at)^2$

$v^2 = u^2 + 2uat + a^2t^2$

$v^2 = u^2 + 2a(ut + \frac{1}{2}at^2)$ —o $s = ut + \frac{1}{2}at^2$

$v^2 = u^2 + 2as$