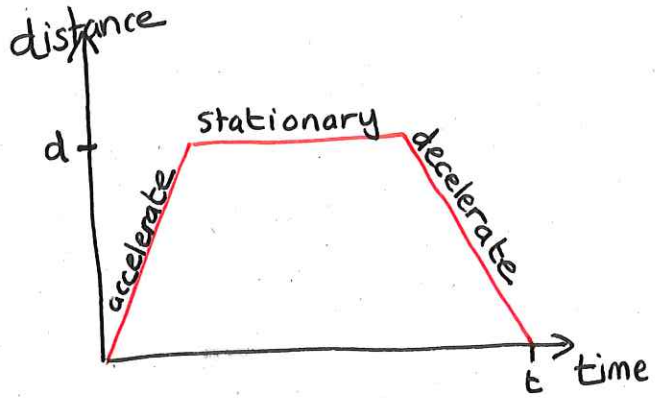
CONSTANT ACCELERATION

DISTANCE TIME GRAPHS

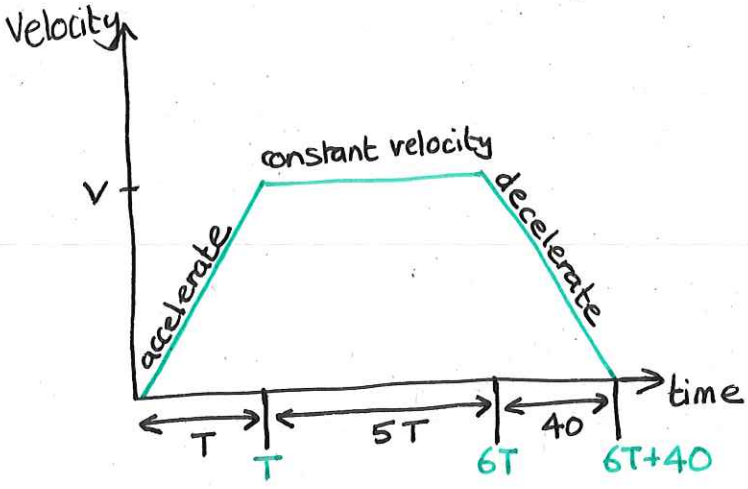


Average Velocity = $\frac{\text{displacement}}{\text{time}}$

Average Speed = $\frac{\text{total distance}}{\text{time}}$

For this graph: displacement = 0
total distance = d + d = 2d

VELOCITY-TIME GRAPHS



Gradient = acceleration (+) or deceleration (−)

Distanced Travelled = Area under graph

Area of Trapezium = $\frac{1}{2}(a+b)h$

For this graph: a = 5T b = 6T+40
h = V

SUVAT EQUATIONS

$$V = u + at$$

$$V^2 = u^2 + 2as$$

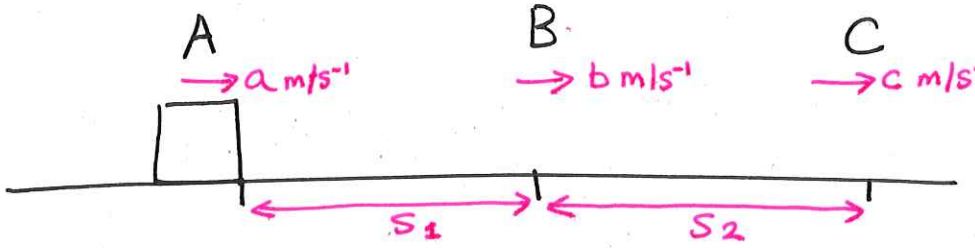
$$s = \left(\frac{u+v}{2}\right)t$$

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

$$s = vt - \frac{1}{2}at^2$$

SUVAT - Horizontal

constant acceleration (x) for whole journey



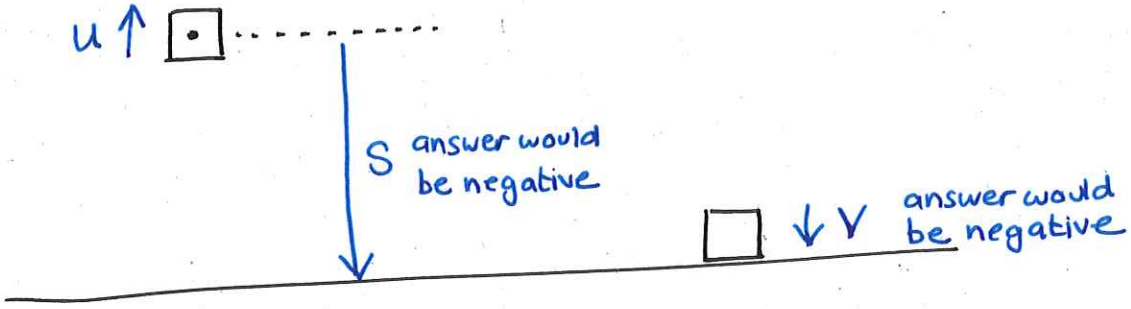
AB
$s = s_1$
$u = a$
$v = b$
$a = x$
$t = t_1$

BC
$s = s_2$
$u = b$
$v = c$
$a = x$
$t = t_2$

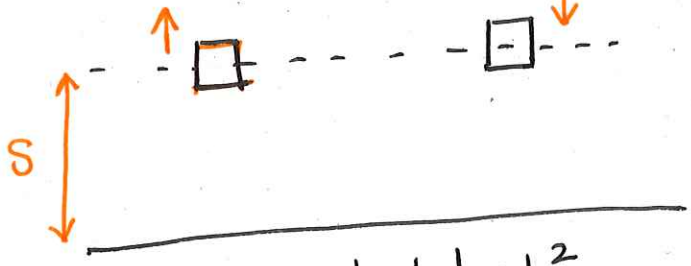
AC
$s = s_1 + s_2$
$u = a$
$v = c$
$a = x$
$t = t_1 + t_2$

SUVAT - Vertical

Greatest height
velocity = 0 m/s⁻¹



Time above a given height



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

$0 = \frac{1}{2}at^2 + ut - s$

Quadratic so 2 solutions t_1 and t_2

t_1 = time on way up

t_2 = time on way down

Time above height s
$= t_2 - t_1$