① Initial velocity = 10m/s

Displacement = -50m

$g = 10ms^{-2}$

a $-50 = 10t - \frac{1}{2} 10t^2$

$-50 = 10t - 5t^2$

b $-5t^2 + 10t + 50$

$t = 2s$

$V = U - gt$

$V = 10 - 20$

$V = -10 m/s$

(2) $S = 0 - \frac{1}{2}(9.8)(5)^2$

$S = 0 - 4.9(5)^2$

$= -4.9(5)^2$

$= -122.5$

Height $= 122.5\,m$

(iii)

(ii) $S_{n^{th}} = u - \frac{g}{2}(2n-1)$

$S_{5^{th}} = 10 - \frac{9.8}{2}(2(5)-1)$

$S_{5^{th}} = 10 - \frac{9.8}{2}(9)$

$S_{5^{th}} = 10 - 4.9(9)$

$10 - 44.1$

$= -34.1$

(3) $v^2 - u^2 = -2gs$

$(15)^2 - (22)^2 = -2(10)(s)$

$= 225 - 484 = -20s$

$= -259 = -20s$

$s = \frac{-259}{-20} \times 5 = \frac{-1295}{100}$

$= -12.95$

$-12.95 = 15t + \frac{-1}{2}(10)t^2$

$-12.95 = 15t - 5t^2$

$0 = 15t - 5t^2 + 12.95$

$0 = -5t^2 + 15t + 12.95$

$t = \frac{-15}{-5} = 3s$