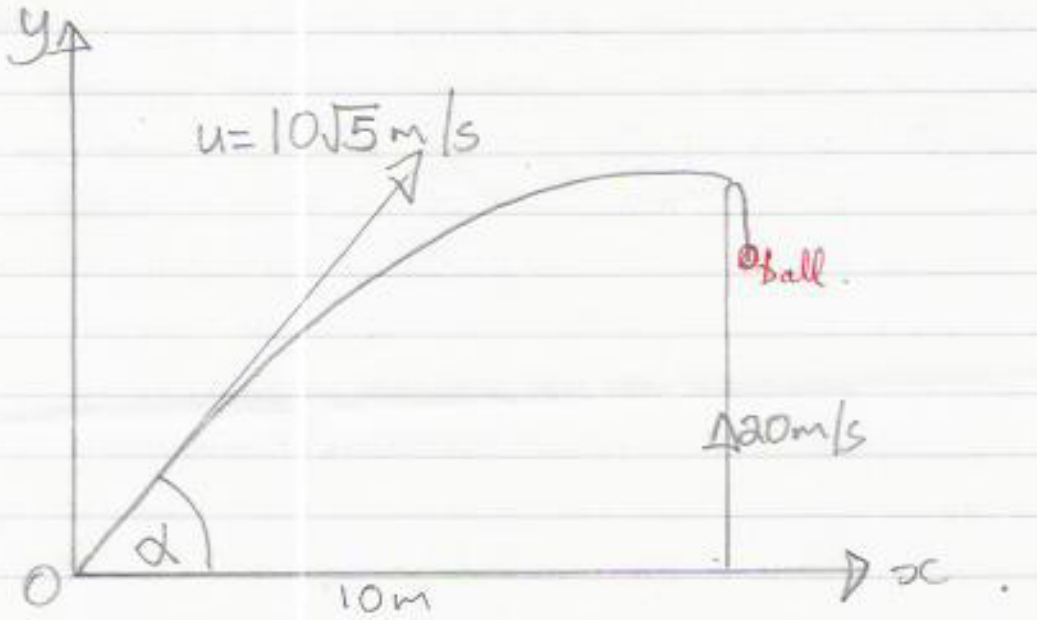

i) For the ball ✓

$u_y = 20\,m/s \quad a = -10\,m/s \quad v_y = 0$ at max height ✓ for motion under constant acceleration

Explain any symbols you use

$v_y^2 = u_y^2 + 2as_y$

$0 = 20^2 + 2 \times -10 \times s_y$

$s_y = \frac{400}{20} = 20m.$ ✓ 3⁻/3

$v_y = u_y + at$

$0 = 20 - 10 \times t$

$t = \frac{20}{10} = 2s$ (to reach max height) ✓ 2/2

ii) Rest → for the stone

Newton's 2nd Law

$m\ddot{x} = 0 \Rightarrow \ddot{x} = 0$ ✓

$\int_{10\sqrt{5}\cos\alpha}^{\dot{x}} \ddot{x}\,dt = \int_0^t 0\,dt$ ✓ $\int 0\,dt = c$ but $\int 0\,dt$ between any limits is 0.

$\dot{x} - 10\sqrt{5}\cos\alpha = c$

$\dot{x} = 10\sqrt{5}\cos\alpha + c$

$\dot{x} = 10\sqrt{5}\cos\alpha \quad (c = 0)$ Why is $c = 0$? ✓

$\int_0^x \dot{x}\,dt = \int_0^t 10\sqrt{5}\cos\alpha\,dt$

$x = 10t\sqrt{5}\cos\alpha$ ✓ 2⁻/3

Rest ↑ down

$m\ddot{y} = -mg \Rightarrow \ddot{y} = -g$ ✓

$\int_{10\sqrt{5}\sin\alpha}^{\dot{y}} \ddot{y}\,dx = \int_0^t -g\,dt$ ✓

$\dot{y} - 10\sqrt{5}\sin\alpha = -gt$ ✓