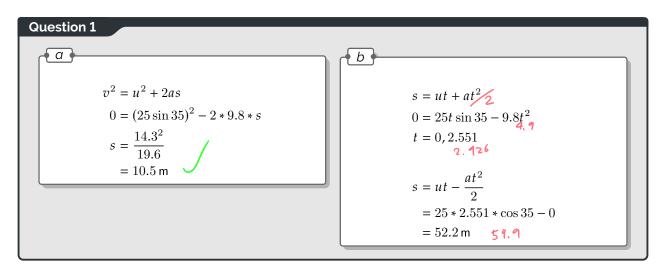
## Revision 1

## Jack Maguire



Question 2 
$$s = ut - \frac{at^2}{2}$$

$$-28 = 0 - 4.9t^2$$

$$t = \sqrt{\frac{28}{4.9}}$$

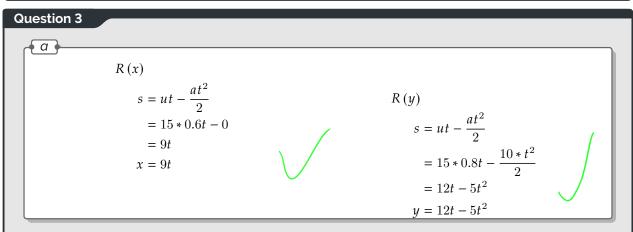
$$= 2.39 \dots$$

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

$$45 = 2.39u - 0$$

$$u = \frac{45}{2.39}$$

$$= 18.8 \, \text{m s}^{-1}$$



b

$$x = 9t$$
$$t = \frac{x}{9}$$

$$y = 12t - 5t^2$$

$$y = 12^{\frac{x}{9}} - 5^{\frac{x^{2}}{9}}$$

$$4 \qquad 5 \qquad 0$$

$$y = \frac{4}{3}x - \frac{5}{81}x^2$$

C

$$0 = \frac{4}{3}x - \frac{5}{81}x^2$$

$$x = 0, 21.6$$

$$x = 21.6 \,\mathrm{m}$$

## **Question 4**

• No air resistance (no horizontal acceleration)

• No external factors (eg. child hitting the ball midway through) > No external factors (eg. child hitting the ball midway through)

• Constant gravity value, irregardless of location or height \

b

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

$$= 30 * \cos 40t - 0$$

R(y)

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

$$= 30 * \sin 40t - \frac{9.8 * t^2}{2}$$
$$= 19.3t - 4.9t^2$$

$$= 19.3t - 4.9t^2$$

$$y = 19.3 - 4.9t^2$$

(C)

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

$$34 = 23.0t - 0$$

$$t = \frac{34}{23.0}$$
$$= 1.48 \,\mathrm{s}$$

$$= 1.48 \, s$$

**d**  $\frac{dy}{dt} = 12 - 10t$  $v_y = 19.3 - 9.8t$ = 19.3 - 9.8 \* 1.48 $=4.78\,{\rm ms}^{-1}$  $v = \sqrt{23^2 + 4.78^2}$ = 23.5 ms<sup>-1</sup>  $\tan\theta = \frac{O}{A}$  $\theta = \arctan \frac{4.78}{23.0}$  $= 11.8^{\circ}$ The ball is still rising at  $23.5\,\mathrm{ms^{-1}}$  at an angle of  $11.8^\circ$  from the horizontal.

## **Question 5**

**a** 

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

$$0^{2} = (u \sin \alpha)^{2} - 2 * 0.3 * g$$
???
$$v^{2} = 39$$

$$55 = 39$$

??? Pases through (12,0.1) Vx coust, so x= 12= U cos ox + , += 12 the expand + and to get ans

() find as form ton a and subsin

Yes - it is only 12m away. XUS

1 de

- Doesn't account for squashing/stretching of ball in air.
- · Doesn't account for air resistance
- · Doesn't account for weather.