

Planet Holloway **websheet 3.6**

*AP Physics C* - Chapter 3

You may print this out and write on it or work on your own paper.

**Show all work.**

1. A car is initially moving at 30 m/s west and a little while later it is moving at 15 m/s south. What is the direction of the average acceleration of the car during this interval?
2. A baseball is thrown at 34 m/s at an initial angle of  $40^\circ$  with respect to horizontal. What is the maximum height of the throw?
3. A plane flying at a speed of 55 m/s at an altitude of 400 m loses a passenger (they stepped out an exit thinking it was the bathroom). What is the final speed of the passenger when they reach the ground?
4. A rock is thrown from the top of a 15 m high building at 20 m/s at an angle of  $22^\circ$  above the horizontal. What are the final horizontal and vertical components of velocity?
5. A penguin is thrown with an initial speed of 18 m/s at an angle of  $40^\circ$  above the horizontal. What is the horizontal displacement of said penguin?
6. A frog jumps up at 7 m/s at an angle of  $27^\circ$  above the horizontal. How long is the frog in the air?

Answers:

1.  $26.6^\circ$  south of east
2. 23.9 m
3. 105 m/s
4.  $v(\text{horizontal}) = 18.54 \text{ m/s}$ ,  $v(\text{vertical}) = 18.87 \text{ m/s}$
5. 31.9 m
6. 0.64 s