**INSTRUCTIONS**: *For each of the following problems, please*

*- Draw a picture to show each situation*

*- List the given information including* ***units and variables***

*- Identify the equation(s) you will use* ***in variable form***

*- Solve the problem and make sure you use the correct units*

1. Harry Potter fires a spell from his wand horizontally with a velocity of 27 from a position 1.3 m off the ground.
   1. How long does it take to strike the ground (assuming gravity works in the land of wizards)?
   2. What horizontal distance does it cover before striking the ground?
2. A Bertie Bott Flavored Bean rolls off a platform that is 5.0 m above the ground. The bean’s velocity as it leaves the platform is 6.0 .
   1. How much time will pass from when the bean leaves the platform to when it hits the ground?
   2. How far away from the base of the platform will the bean hit the floor?
3. Dobby launches himself over a wall. He is fired over level ground at an angle of 35.0° to the horizontal with an initial velocity of 185 .
   1. What is Dobby’s maximum height?
   2. How long is Dobby in the air?
   3. How far away does Dobby land?
4. Hermione throws a bottle with a potion in it off of a cliff at a 25° angle with a velocity of 14 to Ron waiting down below. If the cliff is 21 m high:
   1. How high above the cliff does the bottle go?
   2. How long is it in the air?
   3. How far does it go horizontally before striking the ground? *Hint: Make a sketch illustrating the horizontal and vertical components of distance and show your work in finding the magnitude of each component.*
   4. What are the vertical and horizontal components of velocity just before it hits the ground? What is the actual velocity of the bottle before it hits?

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