Projectiles #4

1. An air rocket is launched with an initial x-velocity of 17 m/s and an initial y-velocity of 13 m/s.
   (a) Draw a diagram of the situations and write down knowns and unknowns.

   (b) Calculate the **magnitude** and **angle** of the rocket's initial resultant velocity.

   (c) Calculate the maximum height of the rocket.

   (d) Calculate the amount of time that the rocket is in the air.

   (e) What is the overall x-displacement of the rocket before it hits the ground?

2. A Hollywood stunt woman drives a car horizontally off a cliff that is 94 m high. With what velocity must she drive the car so that it lands on a barge located 250 m away from the bottom of the cliff (measured horizontally)?

   (a) Draw a diagram of the situations and write down knowns and unknowns.

   (b) How much time will it take for the car to fall down the cliff?

   (c) What velocity did the woman need to have going off the cliff?

   (d) What is the woman's y-velocity just before she hits the ground?

   (e) Draw a triangle to find the woman's **resultant final velocity** and the **angle**.

Answers: (b) 4.38 sec; (c) 57.1 m/s; (d) 42.9 m/s; (e) 71.4 m/s @ 36.9°.