1. A boat in distress distress launches a flare straight up with a velocity of 190 feet per second. The height of the flare in feet can be modeled by the equation: $h(t) = 190t - 16t^2$

a) What is the maximum height of the flare?

b) How many seconds after the flare was shot was it at its maximum height?

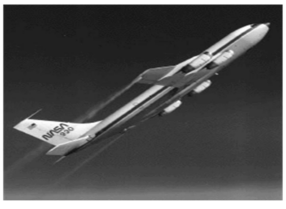
c) Ignoring the height of the boat, how many seconds will it take for the flare to hit the water?

Xmin = _____ Ymi _____

Xmax = _____ Yma _____

2. NASA's KC135A aircraft flies in parabolic arcs to simulate the weightlessness experienced by astronauts in space. The height *h* of the aircraft (in feet) *t* seconds after it begins its parabolic flight can be modeled by the equation $h(t) = -9.09t^2 + 590.85t + 24398.6875$.

a) What is the maximum height of the aircraft during this maneuver and when does it occur?



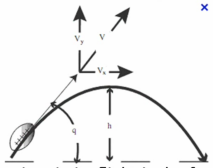
b) If it is only safe for the astronauts to have a 45 second free fall (weightlessness for 45 seconds) how high will the aircraft be when they have to turn the engines back on again?

Xmin = _____ Ymin = _____

Xmax = _____ Ymax = _____

3. **The height of a punted football can be modeled by the function $h(x) = -4.9x^2 + 20x + 1$ where the height of the ball h(x) is given in meters and the time x is in seconds.**

What is the maximum height of the football?



At what time in its flight is the football within 5 eters of the ground?

Xmin = _____ Ymin = _____

Xmax = _____ Ymax = _____