Problems in Kinematics ($g = 9.8\frac{m}{s^2}$)

1) A car starts from rest and accelerates uniformly over a time of $5.21s$ for a distance of $110m$. Determine the acceleration of the car?
   $ans\ 8.10$

2) An airplane accelerates down a runway at $3.20\frac{m}{s^2}$ for $32.8s$ until finally lifts off the ground. Determine the distance traveled before takeoff?
   $ans\ 1720$

3) Upton Chuck is riding the Giant Drop at Great America. If Upton free falls for $2.6s$ what will be his final velocity and how far will he fall?
   $ans\ -25.5\ and\ 33.1$

4) A race car accelerates uniformly from $18.5\frac{m}{s}$ to $46.1\frac{m}{s}$ in $2.47s$. Determine the acceleration of the car and distance traveled?
   $ans\ 11.2\ and\ 79.8$

5) Feather is dropped on moon from a height of $1.4m$. the acceleration of gravity on the moon is $1.67\frac{m}{s^2}$. Determine the time for the feather to fall to the surface of the moon ?
   $ans\ 1.29$

6) A kangaroo is capable of jumping to a height of $2.62m$ .Determine the takeoff speed of the kangaroo?
   $ans\ 7.17$

7) A baseball is dropped straight up into the air and has a hang time of $6.25s$. Determine the height to which the ball rises before it reaches its peak?
   $ans\ 48$

8) A stone is dropped into a deep well and is heard to hit the water $3.41s$ after being dropped. Determine the depth of the well?
   $ans\ 57$

9) A student throws his test paper up in the air (neglecting air resistance) with an initial speed of $8.10\frac{m}{s}$. how long does it take until the paper is headed downward at a speed $3.23\frac{m}{s}$?
   $ans\ 1.16$

10) A ball is thrown upward from the top of a $31.0m$ tower on an unknown planet with an initial speed of $12\frac{m}{s}$ and hits the ground with a speed of $52\frac{m}{s}$. How long was the ball in flight?
   $ans\ 1.55$