Physics Practice Homework #3

1.1)

a) 90 miles/hour = 90*1609/3600 = 40.225 m/s
b) 2.998*10^8 m/s = (2.998*10^8)/(10^9)/0.3048 = 0.9836 foot/nanosec

1.2)

Range: 5.6/100 = 0.056 L/km = 1/(0.056/3.79/1.609) = 108.89 miles/gallon

1.3)

a) 3.43*10^(-5)
b) -1.00*10^7
c) 2.00*10
d) 19.3*10

1.4)

Call the components of R' x' and y'
So we have:

$\sqrt{(x'^2 + y'^2)} = (1^2 + 2^2) = \sqrt{5}$

And

$\sqrt{((1+x')^2 + (2+y')^2)} = 2$

=> x' = 1, y' = -2
=> x' = -2.2, y' = -0.4

1.5)

Optimal angle = □/2 - (□/4 + β/2) = □/2 - β/2 = 45° - β/2