Physics Practice Homework #3

### 1.1)

1. 90 miles/hour = 90\*1609/3600 = 40.225 m/s
2. 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)

1. 3.43\*10^(-5)
2. -1.00\*10^7
3. 2.00\*10
4. 19.3\*10

### 1.4)

Call the components of R’ x’ and y’

So we have:

√(x’² + y’²) = (1² + 2²) = √5

And

√((1+x’)² + (2+y’)²) = 2

=> x’ = 1, y’ = -2

=> x’ = -2.2, y’ = -0.4

### 1.5)

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