ICA9

2022-10-03

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## Question 1

man <- (-20)\*0.35 + 40\*0.35 + 100\*0.3  
pur <- 10\*0.35 + 45\*0.35 + 70\*0.3  
  
man

## [1] 37

pur

## [1] 40.25

We can see that purchase has high expected profit.

## Question 2

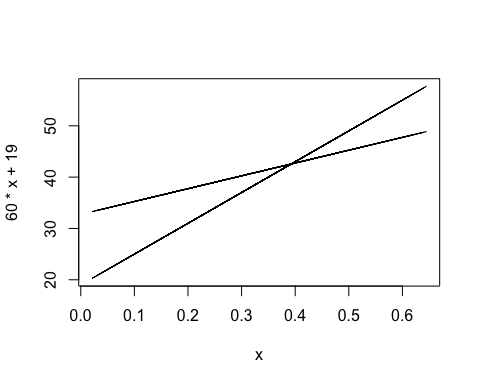
### a

set high demand probability as p

man <- -20*0.35 + 40*(1-0.35-p) + 100*p man <- 60*p + 19 pur <- 10*0.35 + 45*(1-0.35-p) + 70*p pur <- 25*p + 32.75

### b

x = runif(100,0,0.65)  
plot(x = x, y = 60\*x + 19, type = "l")  
lines(x = x, y = 25\*x + 32.75)

  
### c

60*p + 19 = 25*p + 32.75 p = 0.393

Thus when high demand has probability of 0.393 the expected value will be equal.

## Question 3

### a

a = 0.3 \* 5000000  
b = 1 \* (1000000+5000000)/2  
c = 3200000  
a

## [1] 1500000

b

## [1] 3e+06

c

## [1] 3200000

The product c has the highest expected value.

### b

pa = 0.3  
samp = sample(1000000:5000000, 1000000,replace = T)  
pb = (length(samp[samp > 4000000]))/1000000  
c\_sim = rexp(1000000,1/3200000)  
pc = length(c\_sim[c\_sim>4000000])/1000000  
pa

## [1] 0.3

pb

## [1] 0.24953

pc

## [1] 0.285187

Thus product a is most likely to achieve 4000000 revenue.