ICA9

2022-10-03

Contents

Question 1

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

man
```

```
## [1] 37
```

```r
pur
```

```
## [1] 40.25
```

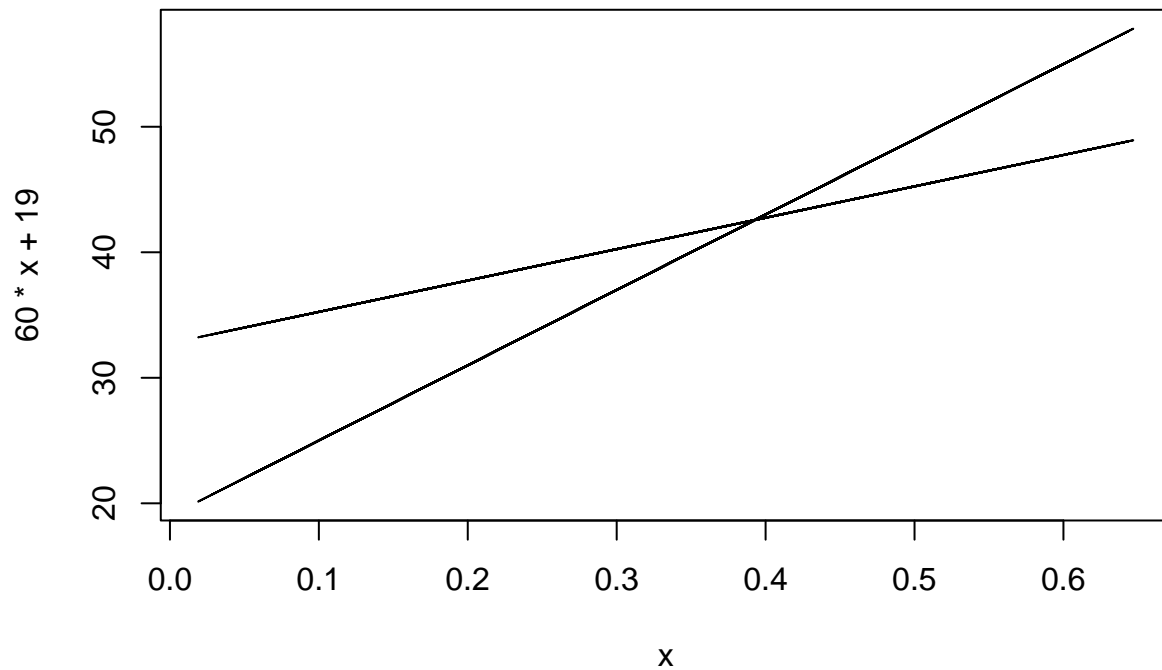We can see that purchase has high expected profit.

Question 2

a

set high demand probability as p

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

b

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

c

$60p + 19 = 25p + 32.75$ 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] 0.250235
```

```
pc
```

```
## [1] 0.286325
```

Thus product a is most likely to achieve 4000000 revenue.