Callin Switzer, Stat110, Hw2 #3(c)

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3(c)

Here is a graph, showing the two functions f(p) = 3p (dotted line), and f(p) = 3p - 3p^2 + p^3 (solid line). f(p)=3p represents what your chances of winning would be if you tripled your chances by purchasing three tickets

f(p) = 3p - 3p^2 + p^3 represents the actual chances of winning when you buy three tickets, over the range of possible p (that is, 0 to 1).

You can also see that for small values of p, the increase is nearly 3p

```
# numbers from 0 to 1
nums <- (1:1000)/1000

# f(p) = 3p
three <- nums*3

# f(p) = 3p - 3p^2 + p^3
under <- 1 - (1-nums)^3

# plot and add a line
plot(three~nums, type = "l", lty = 3, xlab = "p", ylab = "f(p)", ylim = c(0,1))
lines(under~nums, type = "l", lty=1)
legend("bottomright", legend = c("f(p) = 3p", "f(p) = 3p - 3p^2 + p^3"), lty = c(3,1))
```