hw3.R

mwilde

Mon Oct 16 16:51:58 2017

```r
# Matt Wilde
# HW3

# problem 5
# a)
X = rnorm(1000, mean = 3, sd = 1)

# b)
V = exp(0.01*X)
E_V = mean(V)
print(paste("E[V] = ", mean(V)))
```

```
## [1] "E[V] =  1.03004155675887"
```

```r
# c)
W = exp(-0.01*X)
E_W = mean(W)
print(paste("E[W] = ", mean(W)))
```

```
## [1] "E[W] =  0.970922068616906"
```

```r
# d)
# since delta ~ 0.01
delta = 0.00001
deriv = (mean(exp(delta*X)) - mean(exp(-delta*X)))/(2 * delta)
# deriv = (E_V - E_W)/(2 * 0.01)
print(paste("derivative = ", deriv))
```

```
## [1] "derivative =  2.95541279606848"
```

```r
# this is what we expect since the first derivative of the
# moment generating funciton gives the expected value which is
# 3 from the problem.
```