HW14

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1

```
f <- function(x) 1/(1-x)
f_prime <- function(x) 1/(1-x)^2
f_double_prime <- function(x) 2/(1-x)^3
f_triple_prime <- function(x) 6/(1-x)^4

f_prime(0) # 1
```

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

```
f_double_prime(0) # 2
```

```
## [1] 2
```

```
f_triple_prime(0) # 6
```

```
## [1] 6
```

```
f_n <- function(n, x) factorial(n)*(1-x)^(n+1)
sum_n <- function(x) sum(sapply(0:Inf, function(n) x^n/factorial(n)))
```

2

```
f <- function(x) exp(x)
f_n <- function(n, x) exp(x)
en_0 <- 1
sum_n <- function(x) sum(sapply(0:Inf, function(n) x^n/factorial(n)))
```

3

```r
f <- function(x) log(1+x)
f_prime <- function(x) 1/(1+x)
f_double_prime <- function(x) -1/(1+x)^2
f_triple_prime <- function(x) 2/(1+x)^3
f_quad_prime <- function(x) -6/(1+x)^4

f_prime(0) # 1
```

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

```r
f_double_prime(0) # -1
```

```
## [1] -1
```

```r
f_triple_prime(0) # 2
```

```
## [1] 2
```

```r
f_quad_prime(0) # -6
```

```
## [1] -6
```

```r
sum_n <- function(x) sum(sapply(1:Inf, function(n) (-1)^(n+1)*x^n/n))
```

4

```r
f <- function(x) {x^(1/2)}
```