Math camp problem set 1

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Solve all problems by hand, and using R code. Simplify where possible using rules of exponents and logarithms.

1. $\sum_{k=1}^{4}(k-1)^2$

```r
## THIS IS A COMMENT
#### SOLUTION FOR QUESTION 1

### define k
k<-1:4
### sum with the function (k-1)^2
sum((k-1)^2)
```

```
## [1] 14
```

2. $\prod_{i=2}^{10} \frac{i+1}{i}$

```r
i<-2:10
prod((i+1)/i)
```

```
## [1] 5.5
```

3. $\log(e^2)$

```r
log(exp(2))
```

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

4. $e^4 e^{10}$

```r
exp(4) * exp(10)
```

```
## [1] 1202604
```

```r
exp(4 + 10)
```

```
## [1] 1202604
```

5. $10^3 10^{-2}$

```r
10^3 * 10^(-2)
```

```
## [1] 10
```

```r
10^(1)
```

```
## [1] 10
```

```r
10^3 * (1/10^2)
```

```
## [1] 10
```

6. $400^{1/2}$

```r
400^(1/2)
```

```
## [1] 20
```

```r
sqrt(400)
```

```
## [1] 20
```

7. $f(x) = 2x^2 + 3x - 7$. Solve for $x = 12$. For $x = -2$

```r
whateveriwant<-function(x){
  2*x^2 + 3*x -7
}
whateveriwant(12)
```

```
## [1] 317
```

```r
whateveriwant(-2)
```

```
## [1] -5
```

```r
2*12^2 + 3*12 -7
```

```
## [1] 317
```

```r
2*(-2)^2 + 3*(-2) -7
```

```
## [1] -5
```

8. Find the slope and y-intercept of the line that passes through (1,7) and (4,2)

```r
x1<-1
x2<-4
y1<-7
y2<-2
m<-(y2-y1)/(x2-x1)
b<-y1-m*x1
m
```

```
## [1] -1.666667
```

b

```
## [1] 8.666667
```