# A Template for HW solutions; M362M, Fall 2020

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## Problem 1.1

This is where I would explain what I am doing.

**Part a.**

```
1/238746238746
## [1] 4.188548e-12
```

You can write an explanation here, too.

**Part b.**

```
2^45
## [1] 3.518437e+13
```

**Part e.**

```
cos(pi/8)
## [1] 0.9238795
```

**Part f.**

```
exp(2)
## [1] 7.389056
```

**Part h.**

```
log10(2)
## [1] 0.30103
```

## Problem 1.2

### Part 3.

```
A = matrix(c(1, 2, -1, 3), nrow = 2, byrow = TRUE)
A
##      [,1] [,2]
## [1,]    1    2
## [2,]   -1    3
```

What would happen if we left out `nrow = 2` or `byrow = TRUE`?

## Problem 1.3.

### Part 2.

```
my_function <- function(x) {
  if (2 < x & x < 3) {
    return(TRUE)
  } else {
    return(FALSE)
  }
}
```

Let's see if it works (make sure to evaluate the chunk above first; otherwise, R will not know what `my_function` is):

```
my_function(5)
## [1] FALSE
my_function(2.3)
## [1] TRUE
```

A much more concise function can be written:

```
my_shorter_function <- function(x) {
  return(x > 2 & x < 3)
}
```

```
my_function(5)
## [1] FALSE
my_function(2.3)
## [1] TRUE
```

This works because the expression such as `x>2` in R has a logical (i.e., boolean, i.e. `TRUE` or `FALSE`) value.