

# Week 1 Exercises

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Please complete all exercises below WITHOUT using any libraries/packages.

## Exercise 1

Assign 10 to the variable x. Assign 5 to the variable y. Assign 20 to the variable z.

```
x <- 10
y <- 5
z <- 20
```

## Exercise 2

Show that x is less than z but greater than y.

**Note: your output must be a SINGLE boolean, do not output a boolean for each expression.**

```
(x < z) & (x > y)
```

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

## Exercise 3

Show that x and y do not equal z.

**Note: your output must be a SINGLE boolean, do not output a boolean for each expression.**

```
(x != z) & (y != z)
```

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

## Exercise 4

Show that the formula  $x + 2y = z$ .

**Note: your output must be a SINGLE boolean**

```
(x + 2*y) == z
```

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

## Exercise 5

I have created a vector (test\_vector) of integers for you. Determine if any of x, y, or z are in the vector.

**Note: your output must be a SINGLE boolean, do not output a boolean for each expression.**

```
test_vector <- c(1,5,11:22)
```

```
(x %in% test_vector) | (y %in% test_vector) | (z %in% test_vector)
```

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

## Exercise 6

Show which value is contained in the test vector. To do this you will need to create an element-wise logical vector using operators. `x == vector`. Once you have done that you will need to use slicing to return all indices that have matches. **Note: your output should be two integers**

```
contain_x_y_z_vector <- c((x == test_vector) | (y == test_vector) | (z == test_vector))
```

```
which(contain_x_y_z_vector == TRUE)
```

```
## [1] 2 12
```