

# 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.

```
#your code below
```

```
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.

```
#your code below
```

```
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.

```
#your code here
```

```
x != z & y != z
```

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

## Exercise 4

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

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

```
#your code below
```

```
(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)
```

```
#your code below
```

```
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.  $x == \text{vector}$ . 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

```
#your code below
```

```
# returns the values of x, y, and z that are in the test vector
```

```
test_vector[x == test_vector | y == test_vector | z == test_vector]
```

```
## [1] 5 20
```

```
# returns the indices of the values of x, y, and z that are in the test vector
```

```
which(x == test_vector | y == test_vector | z == test_vector)
```

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

y and z are contained in the test vector at indices 2 and 12, respectively. x is not contained in the test vector.