Class Prep 5 | 2.3.2 - 2.3.3

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2022-09-25

Section 2.3.2 Loss of Significance

```
1/3 - .33333333333333
```

```
## [1] 3.330669e-15
```

```
1 - .999999999999
```

```
## [1] 9.999779e-13
```

```
(1 - .999999999999) * 1000
```

```
## [1] 9.999779e-10
```

```
20.55 - 19.2 - 1.35
```

```
## [1] 1.332268e-15
```

```
20.55 - 1.35 - 19.2
```

```
## [1] 0
```

```
quadratic = function(b2, b1, b0){
  t1 = sqrt(b1^2 - 4 * b2 * b0)
  t2 = 2*b2

  x1 = -(b1 + t1)/t2
  x2 = -(b1 - t1)/t2
  return(c(x1, x2))
}

quadratic2 = function(b2, b1, b0)
{
  t1 = sqrt(b1^2 - 4 * b2 * b0)
  t2 = 2*b0

  x1 = t2/(-b1 - t1)
  x2 = t2/(-b1 + t1)
  return(c(x2, x1))
}
```

```r
b2 = 94906265.625
b1 = 189812534.000
b0 = 94906268.375
print(quadratic(b2, b1, b0), digits = 20)
```

```
## [1] -1.0000000144879792607 -1.0000000144879792607
```

```r
print(quadratic2(b2, b1, b0), digits = 20)
```

```
## [1] -1.0000000144879790387 -1.0000000144879790387
```

Section 2.3.3 Overflow and Underflow

There is one typo in this section where the author does not do the same calculations with the integer and double precision numbers.

```
.Machine$double.xmin

## [1] 2.225074e-308

.Machine$double.xmin/2

## [1] 1.112537e-308

.Machine$double.xmax

## [1] 1.797693e+308

2147483647L * 2L

## Warning in 2147483647L * 2L: NAs produced by integer overflow

## [1] NA

2147483647* 2

## [1] 4294967294

.Machine$double.xmax * 2

## [1] Inf
```