This document contains explanations of notation and definitions that we may go over quickly in lecture. If you were confused about notation or think you missed a definition, look here!

1/20

- **Def** An integer $n$ is <u>divisible</u> by integer $m$ if there exists an integer $k$ such that $n = mk$.

We sometimes say "$m$ divides $n$" to mean the same thing as "$n$ is divisible by $m$".

We use the shorthand $n \mid m$ to say $m$ divides $n$.

**ex** $0$ is divisible by $2$ because we can choose $k=0$ and write $0 = 2 \cdot 0$.

$5$ is not divisible by $4$ because there is no integer $k$ so that $5 = 4k$.

$-33$ is divisible by $11$ because $-33 = 11 \cdot (-3)$.

- The ellipsis ($\dots$) notation in math:

$\dots$ means "continuing onward in the same manner."

So $1, 2, \dots, 99, 100$ means "all of the integers between 1 and 100."

By convention, we put two items at the start

(here, 1 and 2) and 2 at the end to be very explicit about the pattern. But in general, look at examples and use your own judgment about how to use ... .

ex $-100, -98, \dots, -4, -2$ even negative integers between $-100$ and $-2$

$\dots -2, -1, 0, 1, 2, \dots$ all integers

$c_0 x_0 + c_1 x_1 + c_2 x_2$ polynomials up to degree 2

$c_0 x_0 + c_1 x_1 + \dots + c_{k-1} x_{k-1} + c_k x_k$ polynomials of degree $k$

- Exponent math rules.

We can simplify expressions with exponents as long as they share the same base!

ex $5^8$ ← exponent, base 5 divided by $5^2$ is $\frac{5^8}{5^2} = 5^6$.

$$x^{10} \cdot x^{11} = x^{21}$$

$$\frac{10^k}{100} = \frac{10^k}{10^2} = 10^{k-2}$$