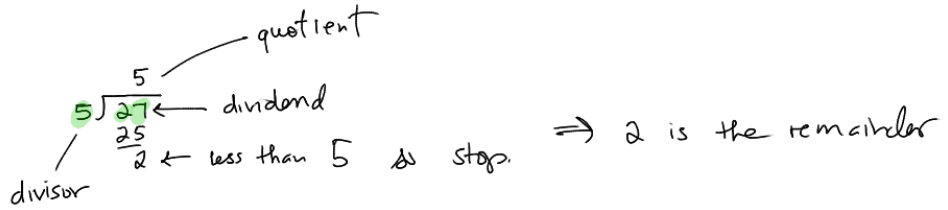


Monday - week 4

Exon 1 - F&L

Long Division:

- ex: for just #'s



- Same process for variables (x)

- Super Basic Examples:

$$x-1 \overline{) x^2-1}$$

↑
see NO x-terms

$$\begin{array}{r} x+1 \\ x-1 \overline{) x^2+0x-1} \\ \underline{-(x^2-x)} \\ x-1 \\ \underline{-(x-1)} \\ 0 \end{array}$$

1

$$\text{So } \boxed{\frac{x^2-1}{x-1} = x+1}$$

NOTE: cross-mult, same as: $x^2-1 = (x+1)(x-1)$

2

$$(x^2-8)(7x^3-2) = 7x^5 - 2x^2 - 56x^3 + 16$$

(review)

Given:

$$\frac{(x^2-8)(7x^3-2)}{x^2-8} = \frac{7x^5 - 2x^2 - 56x^3 + 16}{x^2-8}$$

"

$$7x^3-2$$

Long Div.

$$\begin{array}{r} 7x^3-2 \\ x^2-8 \overline{) 7x^5-56x^3-2x^2+16} \\ \underline{-(7x^5-56x^3)} \\ -2x^2+16 \\ \underline{-(-2x^2+16)} \\ 0 \end{array}$$

$$\begin{array}{r} 7x^3-2 \\ x^2-8 \overline{) 7x^5+0x^4-56x^3-2x^2+16} \\ \underline{-(7x^5-56x^3)} \\ -2x^2+16 \\ \underline{-(-2x^2+16)} \\ 0 \end{array}$$

Example w/ remainder:

$$\begin{array}{r}
 2x^2 - 7x + 18 \\
 x + 2 \overline{) 2x^3 - 3x^2 + 4x + 5} \\
 \underline{-(2x^3 + 4x^2)} \\
 -7x^2 \\
 \underline{-(-7x^2 - 14x)} \\
 18x \\
 \underline{-(18x + 36)} \\
 -31
 \end{array}$$

MEANS

$$\frac{2x^3 - 3x^2 + 4x + 5}{x + 2} = 2x^2 - 7x + 18 - \frac{31}{x + 2}$$




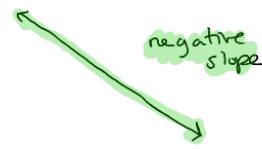








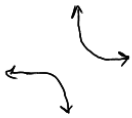
$$\frac{8}{3} = 2 + \frac{2}{3} \quad \text{b/c} \quad 2 \cdot \frac{3}{3} + \frac{2}{3} = \frac{6}{3} + \frac{2}{3} = \frac{8}{3}$$

ANALOGY

$$\begin{array}{r}
 2 \\
 3 \overline{) 8} \\
 \underline{6} \\
 2
 \end{array}$$

degree 0 $\frac{1}{x} < 1$

Basic Shapes of Graphs of Functions

<p>odd</p>  <p>$y=x$</p>	 <p>$y=-x$</p>	 <p>$y=ax^2$ $a>0$</p> <p>even</p>	 <p>$y=ax^3$ $a>0$</p> <p>odd</p>
 <p>$y=ax^4$ $a<0$</p> <p>even</p>	 <p>$y=ax^5$ $a<0$</p> <p>odd</p>	 <p>$y=\frac{1}{x}$</p> <p>odd hyperbolas</p>	 <p>$y=-\frac{1}{x^2}$</p> <p>even hyperbolas</p>
<p>$y=ax^4$ $a>0$</p> 	<p>$y=ax^5$ $a>0$</p> 	<p>$y=\frac{1}{x}$</p> 	<p>$y=\frac{1}{x^2}$</p> 