In Class

Let's use the function $f(x) = (x + 1)(x - 2)^2(3x - 4)$

What is the DEGREE of f(x)? What is the end behavior of that function in both directions?

Fourth: x^4

$x \to -\infty \quad f(x) \to \infty$
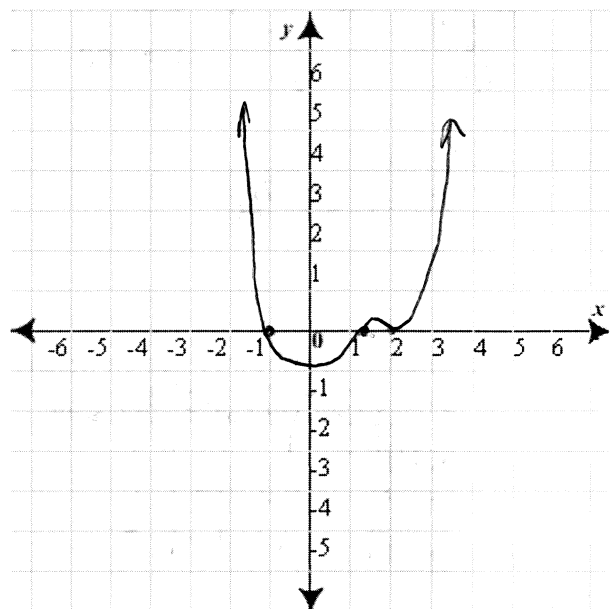
$x \to \infty \quad f(x) \to \infty$

What are the zeros?

$x = -1, 2, 4/3$

How can we tell the shape of the graph everywhere else? We can create what is called a sign chart.

What are the positive and negative intervals? Sketch the graph.

	$(+)$ -1	$(-)$ $4/3$	$(+)$ 2	$(+)$
$x+1$	$-$	$+$	$+$	$+$
$(x-2)^2$	$+$	$+$	$+$	$+$
$(3x-4)$	$-$	$-$	$+$	$+$

Homework

Let's use the function $f(x) = (x+1)(x+3)^3(3x-2)$

What is the end behavior of that function in both directions?
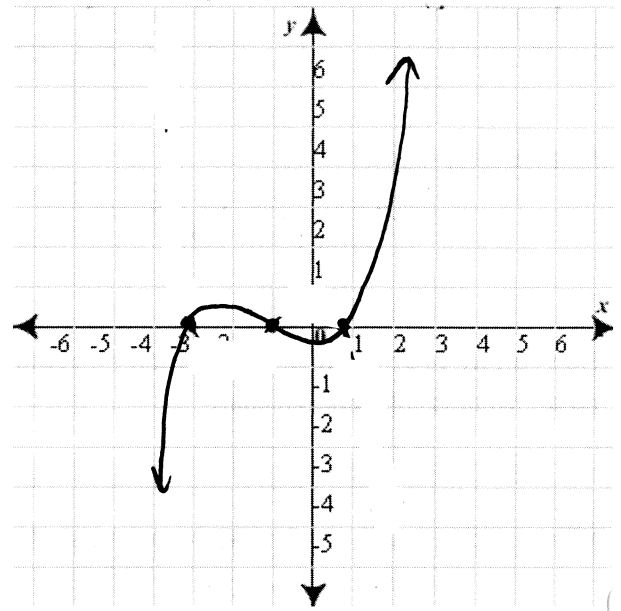
Degree: x^5

5th

$x \to -\infty \quad f(x) \to -\infty$

$x \to \infty \quad f(x) \to \infty$

What are the zeros?

$x = -1, -3, \frac{2}{3}$

Make a sign chart to find the intervals on which f(x) is positive and negative.

$-\infty \quad \ominus \quad -3 \quad \oplus \quad -1 \quad \ominus \quad \frac{2}{3} \quad \oplus \quad \infty$

$(x+1)$	$-$	$-$	$+$	$+$
$(x+3)^3$	$-$	$+$	$+$	$+$
$(3x-2)$	$-$	$-$	$-$	$+$

What are the positive and negative intervals? Sketch the graph.

$+: (-3,-1), (\frac{2}{3}, \infty)$

$-: (-\infty, -3), (-1, 2)$

Lesson 7: The Binomial Theorem
Date: 11/29/17

Let's use the function $f(x) = (x+3)^3(x-1)^2(x-4)$

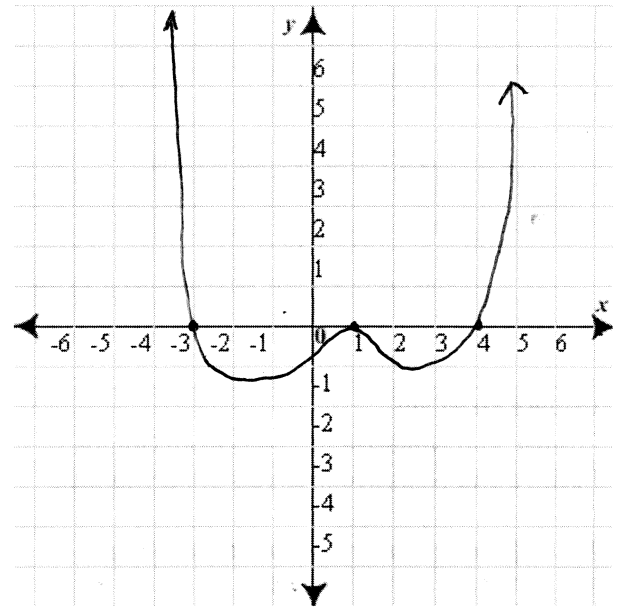What is the end behavior of that function in both directions?

Degree: x^6

sixth

$x \to -\infty \quad f(x) \to \infty$

$x \to \infty \quad f(x) \to \infty$

What are the zeros?

$x = -3, 1, 4$

How can we tell the shape of the graph everywhere else? We can create a sign chart.

What are the positive and negative intervals? Sketch the graph.

Squared? Always +

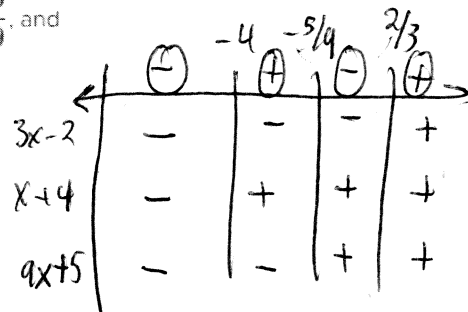|	$-\infty$ ⊕ -3 ⊖ 1 ⊖ 4 ⊕ ∞
$(x+3)^3$	$-$ $+$ $+$ $+$
$(x-1)^2$	$+$ $+$ $+$ $+$
$(x-4)$	$-$ $-$ $-$ $+$

$+: (-\infty, -3), (4, \infty)$

$-: (-3, 1) (1, 4)$

$f(x) = (3x - 2)(x + 4)(9x + 5)$ has zeros at $x = -4$, $x = -\dfrac{5}{9}$, and $x = \dfrac{2}{3}$.

What is the sign of f on the interval $-\dfrac{5}{9} < x < \dfrac{2}{3}$?

○ f is always positive on the interval.

● f is always negative on the interval.

○ f is sometimes positive and sometimes negative on the interval.

In Class Khan Set
Positive and Negative Intervals from Graphs
Positive and Negative Intervals of Polynomials

Time? (You will need to watch the videos)
End Behavior of Polynomials