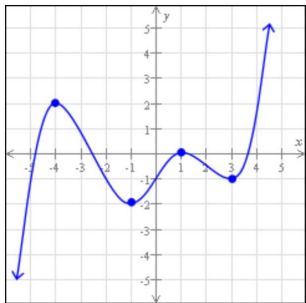


## Definition of a Polynomial

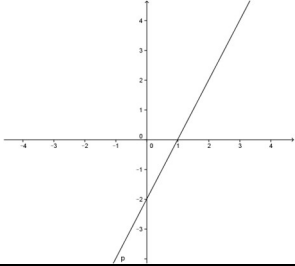
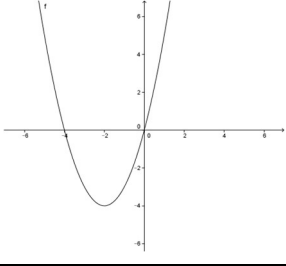
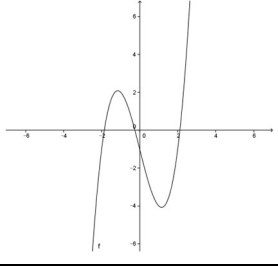
What polynomials can have...	What polynomials can't have...
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## Local Extrema

	<b>Local Minimum</b> Values at which the function has a local minimum:	<b>Local Maximum</b> Values at which the function has a local maximum:
	Local Minimum values:	Local Maximum values:

## Degree

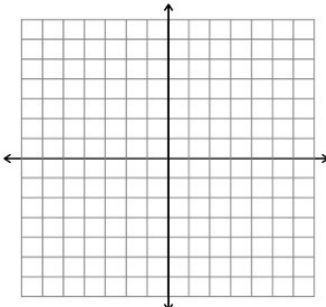
Use the equation of the polynomial to determine its degree. Then use the graph to count the number of changes in direction (turning points) and x-intercepts.

Polynomial Function	$p(x) = 2x - 2$	$p(x) = x^2 + 4x$	$p(x) = x^3 - 4x - 1$
Graph			
Degree			
<i>Critical points</i> # of Turning Points			
# of x-intercepts			

b. What connection do you see between the degree of a polynomial and its number of turning points?

*Critical*

c. What connection do you see between the degree of a polynomial and its number of x-intercepts?

Think about the function: $p(x) = x^4 + 3$	Now graph it: 	How many turning points does it actually have?
How many turning points do you think it should have?		How many x-intercepts does it actually have?
How many x-intercepts do you think it should have?		How could you revise your answers in parts 1b and 1c?

What you have observed is that if the degree is  $n$ :

- The number of x-intercepts is at most  $n$
- The number of turning points is at most  $n - 1$

Or stated differently:

- The minimum degree is the number of x-intercepts OR number of turning points +