

Name: _____ Period: _____ Date: _____

5.3 notes
Polynomial Functions
Objectives: 1. Evaluate polynomial functions
2. Identify general shapes of graphed polynomial functions

Standard form: A polynomial with one variable is written in standard form when:

Degree: _____

Leading coefficient: _____

Practice: Write in standard form & identify degree and leading coefficient.

Ex. $2x^2 + 8x^5 - 4x^3 - x - 3$

Standard form:

Degree:

Leading coefficient:

1. $3x^4 + 6x^3 - 4x^8 + 2x$

standard form:

degree:

Leading coefficient:

2. $-x^3 - 4x^2 + 2x$

Standard form:

Degree:

Leading coefficient:

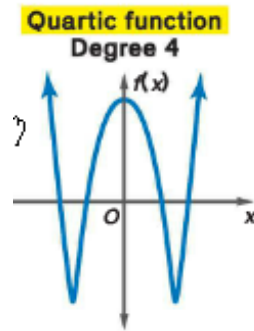
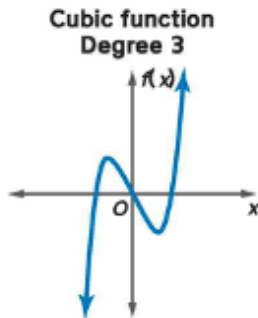
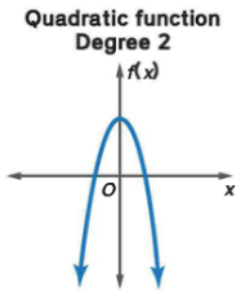
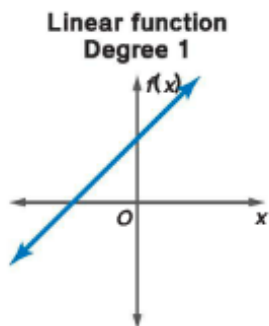
3. $7x^3 - 5x + x^6 + 1$

standard form:

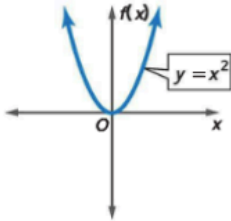
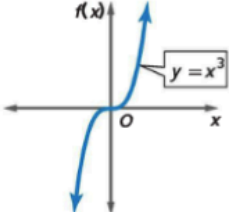
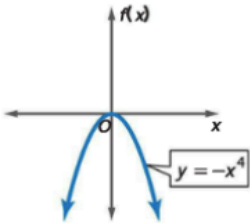
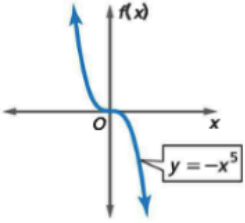
degree:

Leading coefficient:

Polynomial Functions are even or odd, depending on their degree! Odd degree functions have ending behavior similar to a line. Even degree functions relate to a parabola.

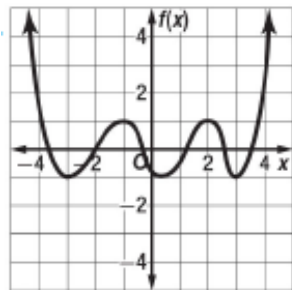
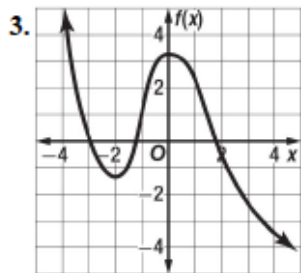
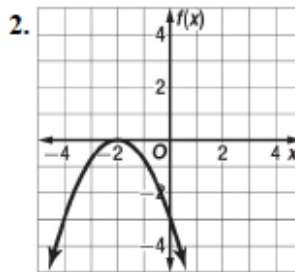
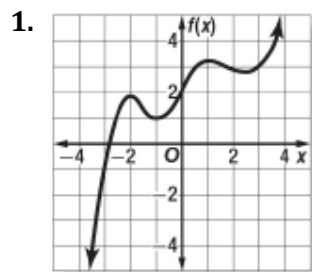


Ending behavior: is described as x approaches positive infinity ($x \rightarrow +\infty$) or negative infinity ($x \rightarrow -\infty$) and describes the increase or decrease in the y values ($f(x) \rightarrow \pm\infty$)

KeyConcept End Behavior of a Polynomial Function	
<p>Degree: even Leading Coefficient: positive End Behavior: $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$</p> <p>$f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$</p>  <p>Domain: all real numbers Range: all real numbers \geq minimum</p>	<p>Degree: odd Leading Coefficient: positive End Behavior: $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$</p> <p>$f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$</p>  <p>Domain: all real numbers Range: all real numbers</p>
<p>Degree: even Leading Coefficient: negative End Behavior: $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$</p> <p>$f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$</p>  <p>Domain: all real numbers Range: all real numbers \leq maximum</p>	<p>Degree: odd Leading Coefficient: negative End Behavior: $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$</p> <p>$f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$</p>  <p>Domain: all real numbers Range: all real numbers</p>

Examples:

For each graph, state whether it represents an odd or even degree function, state the number of real zeros, and describe its ending behavior.



Evaluating polynomial functions for numbers, variables and algebraic expressions.

Ex. If $f(x) = x^2 + 2x - 3$,

ex. Find: $f(-5)$

1. Find : $f(-1)$

ex. Find: $f(2a)$

2. Find: $f(5a)$

Ex. Find: $f(a^2 - 2)$

3. Find: $f(a^2 + 3)$