2.2 Polynomial Functions of Higher Degree

- Use transformations to sketch graphs of polynomial functions
- Determine end behavior by looking at the leading coefficient
- Find and use zeros of polynomial functions as sketching aids

Here are some graphs of polynomial functions:

- **Zeros**
- **End Behavior**
- **Leading coefficient**
- **y-intercept**

Constant function

Linear function

Quadratic function

Cubic function

Quartic function

Other polynomial functions
Transformations of higher degree polynomial functions.

If this is $y = x^3$

If this is $y = x^4$

Guess at these:

Sketching graphs of polynomial functions

If the polynomial factors:
- factor it
- place roots
- y-intercept
- end behavior

$f(x) = x^4 - x^3 - 20x^2$

If it does not factor:
- end behavior
- y-intercept
- estimate some points

$x = -2, y = (-2)^4 - 3(-2) + 1$
$x = -1, y = (-1)^4 - 3(-1) + 1$
$x = 0, y = 0^4 - 3(0) + 1$
$x = 1, y = 1^4 - 3(1) + 1$
$x = 2, y = 2^4 - 3(2) + 1$

$f(x) = x^3 - 3x + 1$