5.1 Polynomials

Polynomial - All exponents Positive integers

$f(x) = -3x^2 + x - 7$ Poly

$f(x) = \frac{4 - x^2}{x} = (4-x^2)x^{-1}$ No

$f(x) = \sqrt{x+3}$ $(x+3)^{1/2}$ No

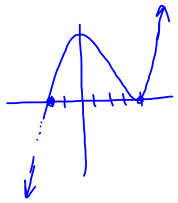
$f(x) = -2x(x-7)^2(x+4)^3$ Poly

Multiplicity:

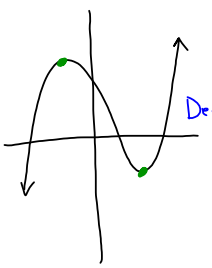
$f(x) = (x-4)^2(x+2)^1$ degree 3

Zeros: $-2, 4$

Multiplicity: $1, 2$ (Cross, Touch)



Turning points rule:



Degree -1

Degree 3

3-1 = 2 Turning Points

$f(x) = -2x^1(x-3)^2(x+4)(x-6)^3$

degree: 7

Max number of turning points: 6

$f(x) = \frac{8-x^6}{5} = \frac{8}{5} - \frac{1}{5}x^6$

Polynomial? yes

Degree? 6

$Ax^2 + Bx + C$ Standard

Standard form $-\frac{1}{5}x^6 + \frac{8}{5}$

Leading term $-\frac{1}{5}x^6$ constant $\frac{8}{5}$

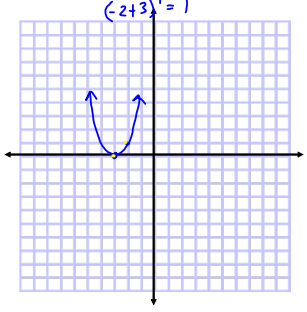
Use Transformations to draw the graph.

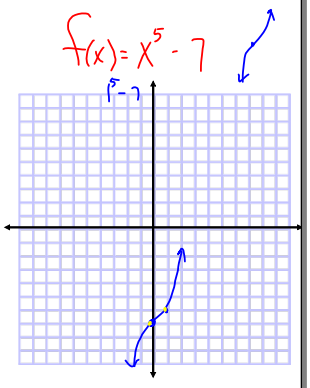
$f(x) = (x+3)^4$

$(-2+3)^4 = 1$

$f(x) = x^5 - 7$

$5 - 7$





$f(x) = -6(x-3)(x+3)^2$

x^2
$-6x^3$
x^4
x^5

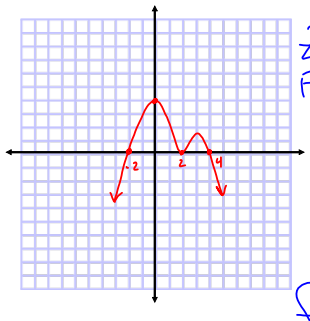
Zeros: $-3, 3$

Multiplicity: 2, 1

The graph (1) Cross the x axis at the larger intercept.
" " (2) touch " " " " smaller "

What function (power) does the graph resemble? $-6x^3$

Construct the polynomial function for this graph.



Zeros: $-2, 2, 4$

Factors:

$f(x) = -(x+2)(x-2)(x-4)$

$-(x^2-4)(x-4)$

$-(x^3-4x^2-4x+16)$

$f(x) = -x^3+4x^2+4x-16$