Math Lab: Graphing Polynomial Functions

These notes are intended as a summary of section 1.3 (p. 32 – 36) in your workbook. You should also read the section for more complete explanations and additional examples.

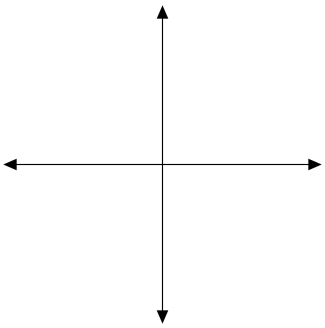
The Graphs of Polynomial Functions

In this section, we will use a computer simulation to plot the graphs of various polynomial functions. We will then discuss the properties of these graphs.

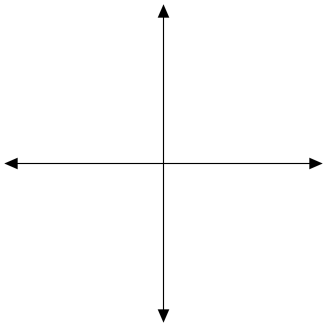
http://www.desmos.com/calculator

Graph each of the following polynomials using the computer simulation. Sketch the graph in the space provided.

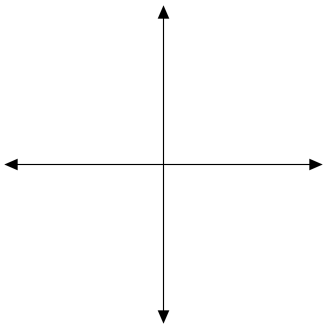
a) $f(x) = 2x^3 + 3x^2 - 3x - 2$



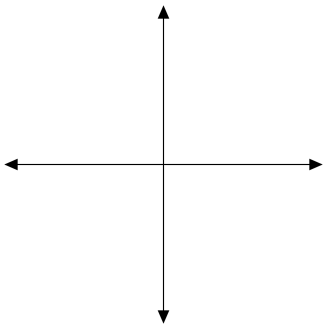
b) $g(x) = -x^3 + 7x + 6$



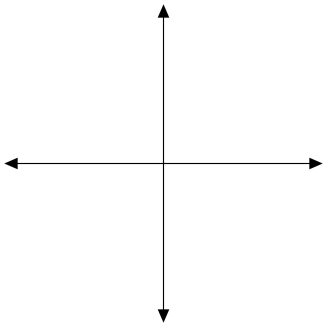
c) $h(x) = x^3 - 3x^2 + 2x + 3$



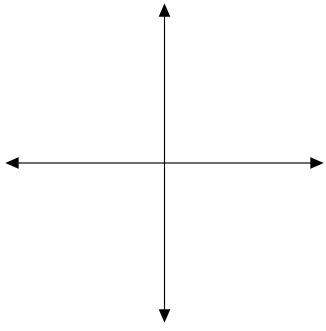
d) $j(x) = x^3 - 4x^2 - 3x + 18$



e) $k(x) = -3x^3 + 19x^2 - 33x + 9$



f) $m(x) = -3x^3 + x^2 - 5x - 7$



How many zeros does each graph have?

a) b)

c) d)

e) f)

In general, how many zeros do you think a graph of a cubic function should have?

How does the sign of the x^3 term affect the shape of the graph?

What is the *y*-intercept of each graph?

a) b)

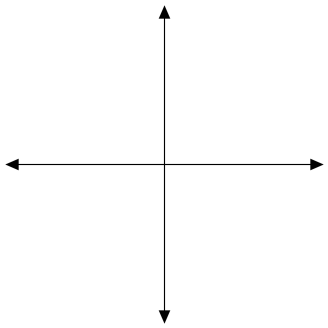
c) d)

e) f)

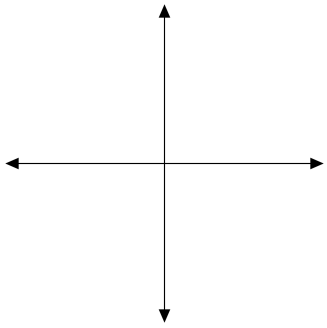
How could you predict the *y*-intercept of the graph from its equation?

Graph each of the following polynomials using the computer simulation. Sketch the graph in the space provided.

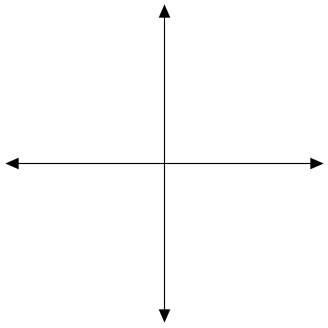
a) $f(x) = -x^4 + 3x^3 + 4x^2 - 12x - 2$



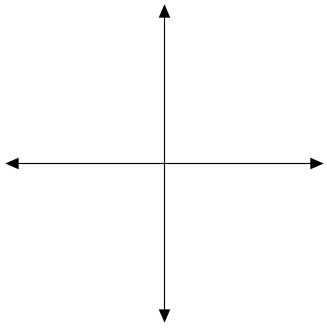
b) $g(x) = x^4 - 2x^3 - 3x^2 + 8x + 9$



c) $h(x) = -2x^4 + 4x^3 - 8x + 10$



d) $j(x) = 2x^4 - 7x^2 - 5x$



How many zeros does each graph have?

a)

b)

c)

d)

In general, how many zeros do you think a graph of a quartic function should have?

How does the sign of the x^4 term affect the shape of the graph?

What is the *y*-intercept of each graph?

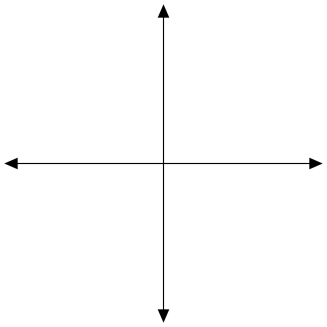
a) b)

c) d)

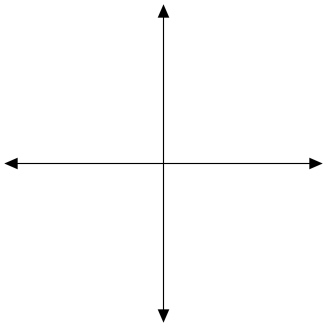
How could you predict the *y*-intercept of the graph from its equation?

Graph each of the following polynomials using the computer simulation. Sketch the graph in the space provided.

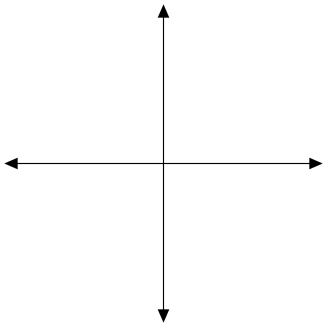
a) $f(x) = x^5 + 2x^4 - 7x^3 - 8x^2 + 12x - 1$



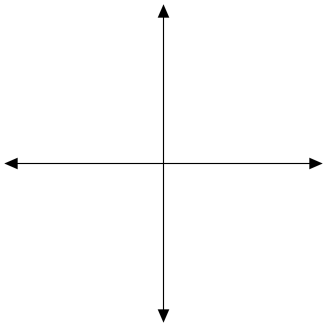
b) $g(x) = -x^5 + 2x^4 + 5x^3 - 3x^2 - 4x + 8$



c) $h(x) = 2x^5 - x^4 + 3x^3 + 5x^2 + x - 3$



d) $j(x) = -2x^5 + x^3 - x^2 + 3x$



How many zeros does each graph have?

a) b)

c) d)

In general, how many zeros do you think a graph of a quintic function should have?

How does the sign of the x^5 term affect the shape of the graph?

What is the *y*-intercept of each graph?

a) b)

c) d)

How could you predict the *y*-intercept of the graph from its equation?