

Advanced Algebra
Polynomial Functions - Review Homework

1) Factor the following polynomials completely:

a) $64x^6 + 27y^3$

b) $x^4 + 5x^2 - 36$

2) Use *Completing the Square* to put this quadratic equation into graphing form.

$$y = 2x^2 - 9x - 5$$

For each of the following polynomial functions,

- a) make a table classifying the possible roots based on Descartes Rule of Signs
- b) list all the possible rational roots
- c) find all the roots (real and imaginary)

3) $f(x) = 6x^3 - 17x^2 - 4x + 3$

$$4) f(x) = 4x^4 - 16x^3 - 5x^2 + 19x + 4$$

$$5) f(x) = x^4 - 3x^2 - 40$$

6) $f(x) = 4x^4 + 18x^3 - 28x^2 - 90x$

7) How many times does the graph of $f(x) = x^4 - 3x^2 - 40$ (see #5) cross the x-axis?

8) Sketch a graph of the function, $f(x) = x(x-3)^2(x+2)$, noting all the x-intercepts on the graph. The graph does not need to be to scale.