Review Exercise Set 3

Exercise 1: State which functions are polynomials. For those that are polynomials also state their degree.

a. $f(x) = 12x^5 - 14x^3 + 6x$

b. $h(s) = \frac{s^4}{2} + \sqrt{2}s^3 - 0.735s^2 - s + 10$

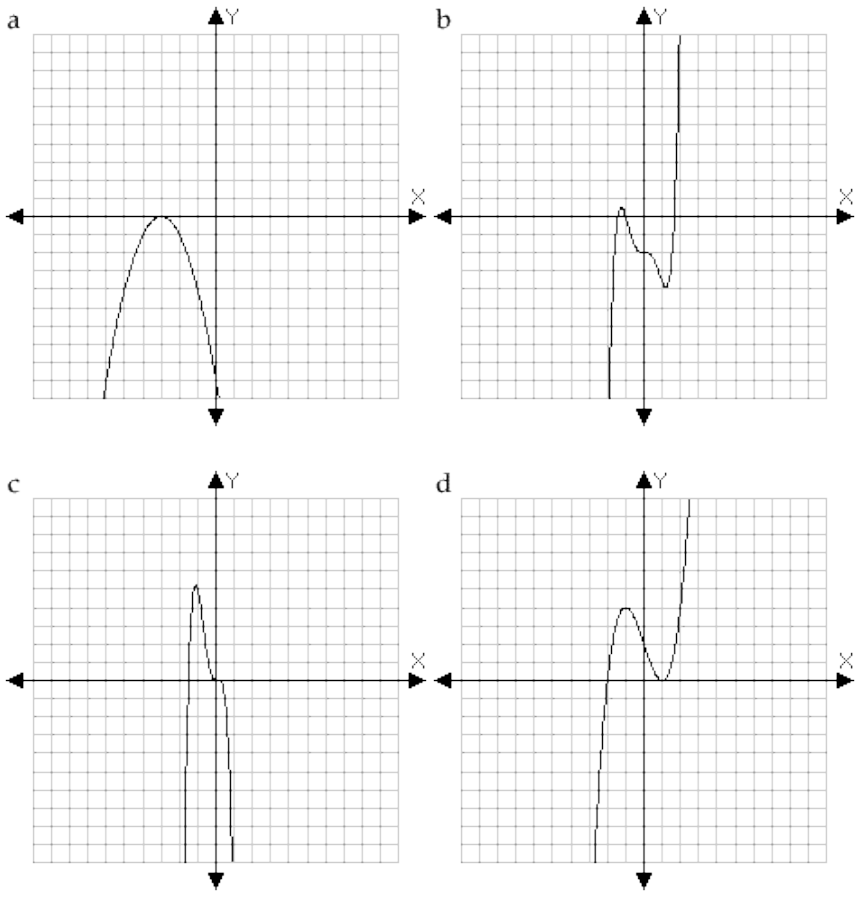
c. $g(t) = \sqrt{t^2 - t + 4}$

d. $w(x) = x^{½} + \frac{4}{3x} - 6$

Exercise 2: Match the given polynomial functions to their graphs.

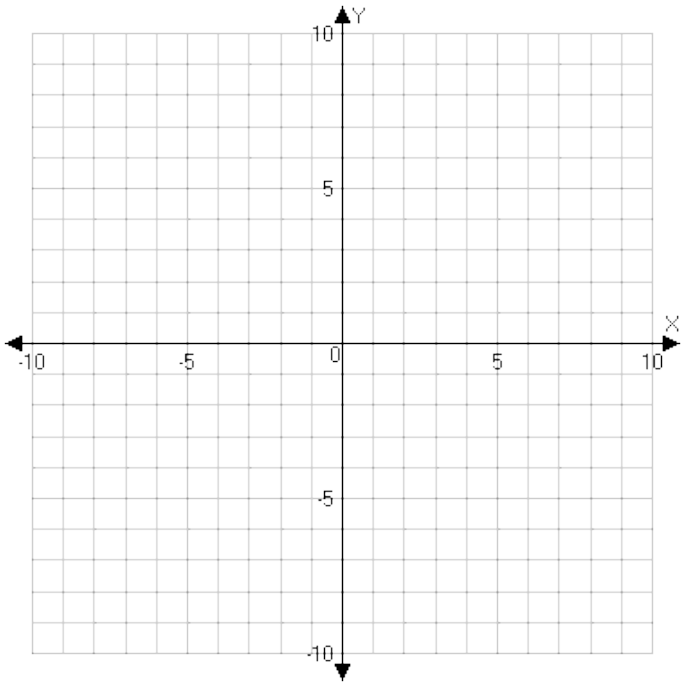
$f(x) = x^3 - 3x + 2$ $g(x) = -2x^4 - 5x^3 + 3x^2$

$h(x) = -x^2 - 6x - 9$ $k(x) = 6x^5 - 15x^3 + x^2 - 10$



Exercise 3: Sketch the graph of the following polynomial by transforming the base power function, $y = x^n$.

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



Exercise 4: Find all real zeros (and their multiplicity) of the given polynomial.

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

Exercise 5: Find an equation of the polynomial that has the given zeros.

-3, 0 (multiplicity 2), 3

Review Exercise Set 3 Answer Key

Exercise 1: State which functions are polynomials. For those that are polynomials also state their degree.

a. $f(x) = 12x^5 - 14x^3 + 6x$

polynomial: Yes
degree: 5

b. $h(s) = \frac{s^4}{2} + \sqrt{2}s^3 - 0.735s^2 - s + 10$

polynomial: Yes
degree: 4

c. $g(t) = \sqrt{t^2 - t + 4}$

polynomial: No

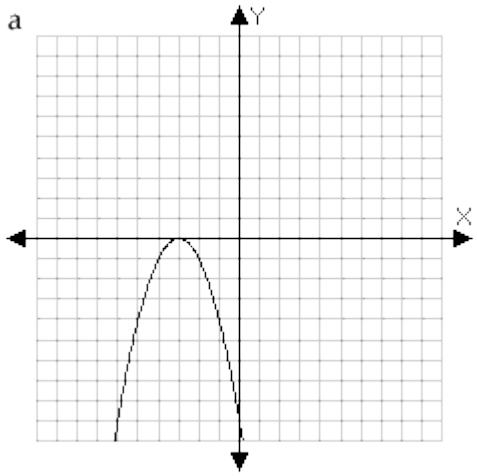
d. $w(x) = x^{\frac{1}{2}} + \frac{4}{3x} - 6$

polynomial: No

Exercise 2: Match the given polynomial functions to their graphs.

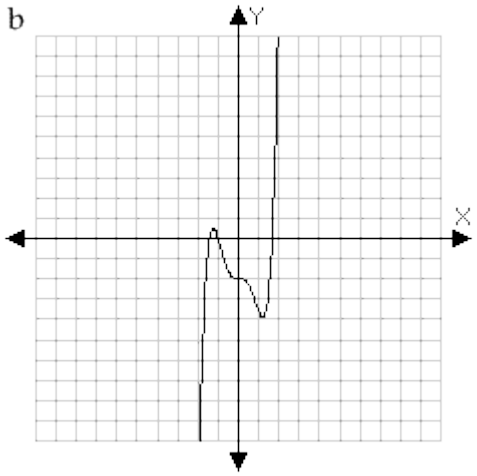
$f(x) = x^3 - 3x + 2$ $g(x) = -2x^4 - 5x^3 + 3x^2$
$h(x) = -x^2 - 6x - 9$ $k(x) = 6x^5 - 15x^3 + x^2 - 10$

a



$h(x) = -x^2 - 6x - 9$

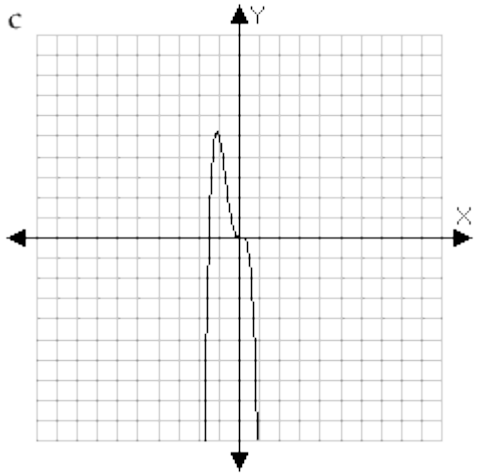
b



$k(x) = 6x^5 - 15x^3 + x^2 - 10$

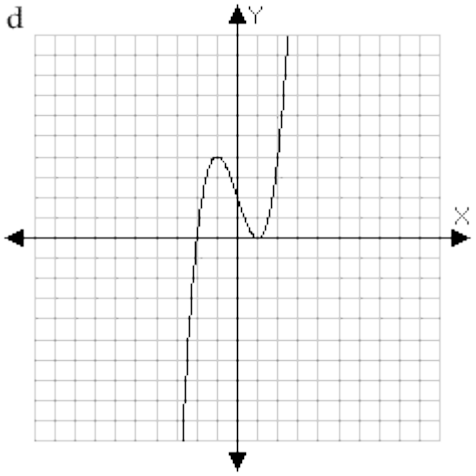
Exercise 2 (Continued):

c



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

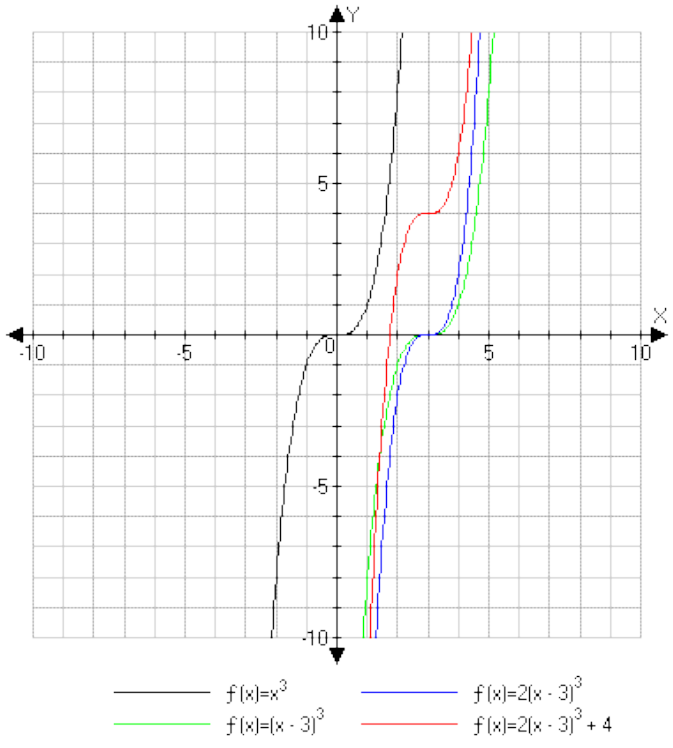
d



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

Exercise 3: Sketch the graph of the following polynomial by transforming the base power function, $y = x^n$.

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



Exercise 4: Find all real zeros (and their multiplicity) of the given polynomial.

$g(x) = x^4 - 4x^2$
$g(x) = x^2(x^2 - 4)$
$g(x) = x^2(x - 2)(x + 2)$

$x^2 = 0$ or $x - 2 = 0$ or $x + 2 = 0$
$x = 0$ or $x = 2$ or $x = -2$

Real zeros:

x = 0; multiplicity 2
x = 2; multiplicity 1
x = -2; multiplicity 1

Exercise 5: Find an equation of the polynomial that has the given zeros.

-3, 0 (multiplicity 2), 3

$x = -3$; $x = 0$; $x = 3$
$x + 3 = 0$; $x = 0$; $x - 3 = 0$

$p(x) = (x + 3)(x)^2(x - 3)$
$p(x) = x^2(x + 3)(x - 3)$
$p(x) = x^2(x^2 - 9)$
$p(x) = x^4 - 9x^2$