Déjà Vu, It's Algebra 2!
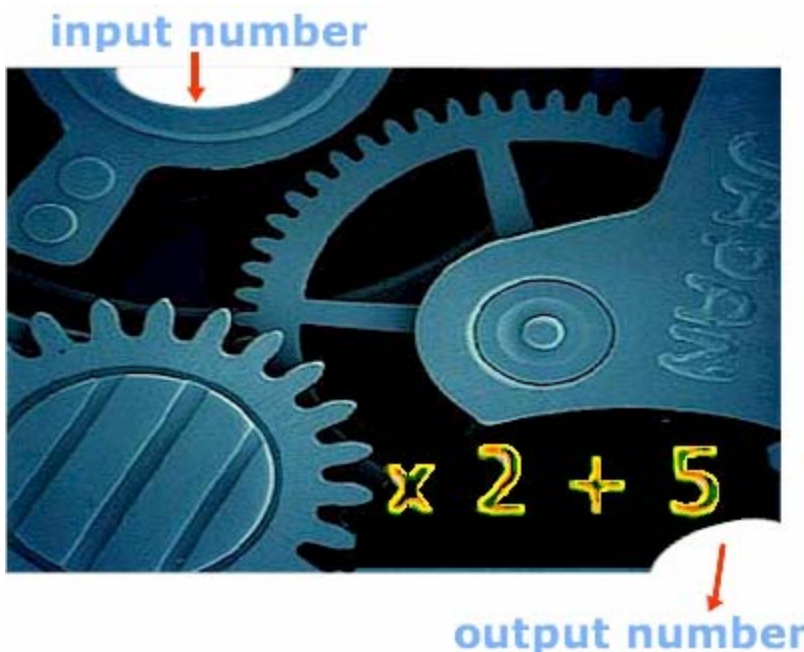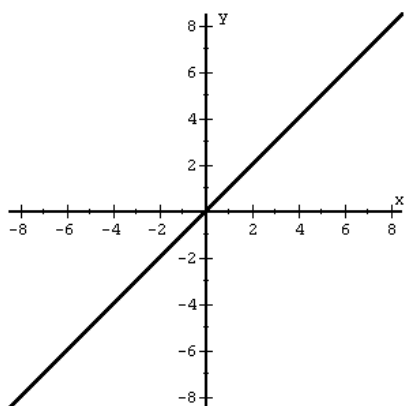# Lesson 27
Building Functions from Functions

A parent function is a basic representative of a particular type of function from which all others of that type can be created.

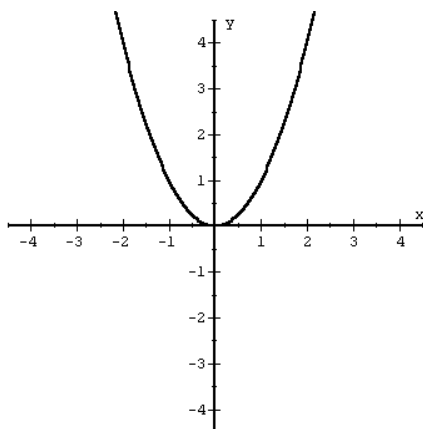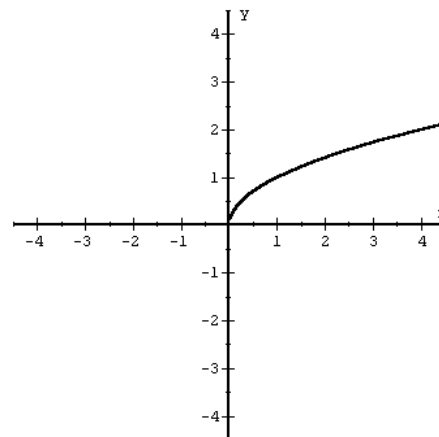We can create NEW functions from these parent functions by using a sequence of transformations.

input number

x 2 + 5

output number

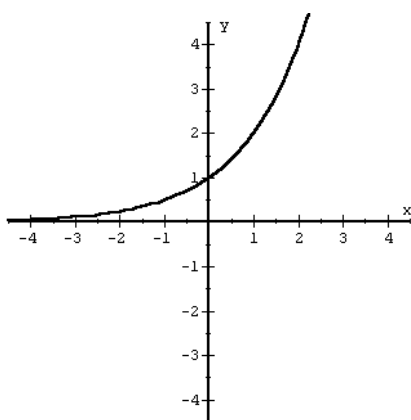# Examples of parent functions.

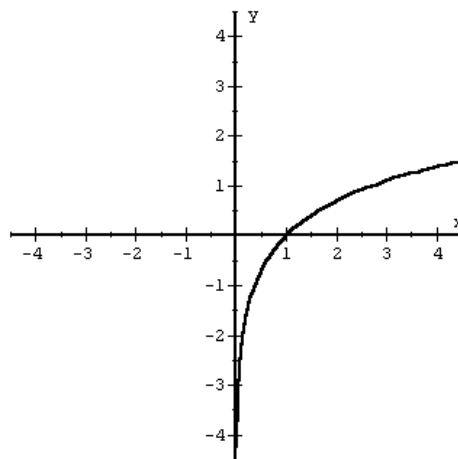$f(x) = x$
Linear
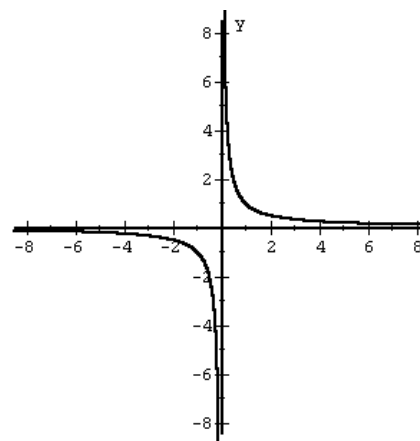
$f(x) = x^2$
Quadratic

$f(x) = \sqrt{x}$
Square Root

$f(x) = b^x$
Exponential

$f(x) = \log_b x$
Logarithmic

$f(x) = \dfrac{1}{x}$
Reciprocal (Rational)

Example:

Sketch $f(x) = -\sqrt{x-1} - 1$, then list domain and range.

Example:

Sketch $g(x) = 4 - 3^{x+1}$, then list domain and range.

We can also create new functions by combining functions using the following operations:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Composition

For the following examples, let
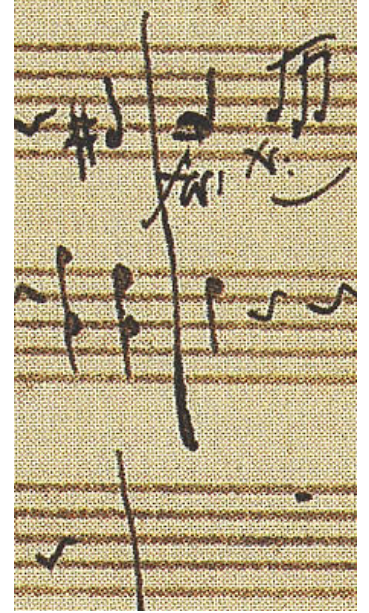$f(x) = 6x^2 - x - 12$, $g(x) = 2x - 3$, and $h(x) = \sqrt{x}$

Find . . .

i) $f(x) + g(x) = (f + g)(x) =$

ii) $g(x) - f(x) = (g - f)(x) =$

iii) $f(x) \cdot g(x) = (fg)(x) =$

iv) $\dfrac{f(x)}{g(x)} = \left(\dfrac{f}{g}\right)(x) =$

A Mozart
Composition

v) $f(g(x)) = (f \circ g)(x) =$

vi) $h(g(f(x)) = (h \circ g \circ f)(x) =$

vii) $h(g(f(-1)) = (h \circ g \circ f)(-1) =$

viii) $h(g(f(-2)) = (h \circ g \circ f)(-2) =$

Déjà RE-Vu

A local automobile dealer is offering the following deal on a new car:

1. A 5% rebate on the purchase price

AND

2. $1000 cash back on purchase price.

He'll allow you to take either offer in any order you specify. If the selling price of the new car is $30,000, in which order should you request your "deals?"

Math is everywhere!

References:
http://www.infantilescoliosis.org/images/parent_and_Child_holding_hands_icon.jpg
http://library.thinkquest.org/18713/media/images/function=machine.jpg
http://rmc.library.cornell.edu/mozart/pics/illustrations/compose.jpg
http://www.clipartof.com/images/clipart/thumbnail2/2813_cool_guy_driving_a_convertible_car.jpg