

## Slope Function for $f(x) = x^n$ (The Power Rule)

The following table summarizes the slope functions for the three functions that we have investigated so far:

$f(x)$	$f'(x)$
$x$	$1$
$x^2$	$2x$
$x^3$	$3x^2$

There is a pattern (rule) that defines the relationship between  $f(x)$  and  $f'(x)$ , which is easier to see if we filled in more table entries:

$f(x)$	$f'(x)$
$x$	$1x^0$
$x^2$	$2x^1$
$x^3$	$3x^2$
$x^4$	$4x^3$
$x^5$	$5x^4$
$x^6$	$6x^5$

We can generalize this rule for functions of the form

$$f(x) = x^n$$

where  $n$  is any positive integer:

$$f'(x) = nx^{n-1}$$

This is known as the *Power Rule*.