Derivatives – The Power Rule

$f(x) = x^3$ * (show graph on graphing calculator)

Notation: $f'(x) = 3x^2$ ← Power Rule

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

What info does the derivative give you?

A: many things but for right now – Equation for the slope of the tangent line.

* (explain how you can use eqn for y_{tan} to find slope @ any x-value on graph)

Ex. 1) Find the slope of the tangent line for $f(x) = x^4$ @ $x = 2$.

$f'(x) = 4x^3$ ← eqn. for the slope of the tangent line

To find the slope

$m = 4x^3 = 4(2)^3 = 32$

Ex. 2) Same directions as Ex. 1

$f(x) = x^8$ @ $(-1, 1)$

$f'(x) = 8x^7$

$m = 8(-1)^7 = -8$