# 5.2 Antiderivatives

(1) What is derivative of $f(x) = \sin x + 2$? $g(x) = \sin x + 3$?

$f'(x) = \cos x$ $g'(x) = \cos x$

(2) What is derivative of $f(x) = 2x^2 - x + 10$? $g(x) = 2x^2 - x - 8$?

$f'(x) = 4x - 1$ $g'(x) = 4x - 1$

* Functions that differ only by a constant have same derivative and are parallel!

(3) If $f'(x) = \sec^2 x$, what is $f(x)$?

$f(x) = \tan x + C$

(4) If $f'(x) = \sin x$, what is $f(x)$?

$f(x) = -\cos x + C$

(5) If $f'(x) = 3x^2 + x$, what is $f(x)$?

$f(x) = x^3 + \frac{1}{2}x^2 + C$

(6) If $f'(x) = 2x^4 - 3x^2 + 8x + 2 - \frac{1}{x}$, what is $f(x)$?

$= \frac{2}{5}x^5 - x^3 + 4x^2 + 2x - \ln x + C$

(7) If $f'(x) = 2x^3 - 3x^2 + 4x$ what is $f(x)$ that goes thru $(1, -2)$?

$f(x) = \frac{1}{2}x^4 - x^3 + 2x^2 + C$ plug in $(1, -2)$ and solve for $C$

$-2 = \frac{1}{2}(1)^4 - 1^3 + 2(1)^2 + C$