IN CLASS **SUPER FAST** PROBLEMS

ULTRA QUICK DERIVATIVES		
$a(x)=\cos 5x$ $a' = -5\sin 5x$	$b(x)=\csc 3x$ $b' = -\csc 3x \cot 3x \cdot 3$ $b'(x) = -3\csc 3x \cot 3x$	$c(x)=\sin^3(7x)$ $c'(x) = 3(\sin 7x)^2 \cos 7x \cdot 7$ $c'(x) = 21(\sin 7x)^2 \cos 7x$
$d(x)=\frac{2}{\sqrt{4-x}} = 2(4-x)^{-1/2}$ $d'(x) = -1(4-x)^{-3/2}(-1)$ $d'(x) = \frac{1}{(4-x)^{3/2}}$	$e(x)=x\sqrt{x} = x^{3/2}$! $e'(x) = \frac{3}{2}x^{1/2}$	$f(x)=\frac{2x-6x^5}{x^2} = 2x^{-1} - 6x^3$ $f' = -2x^{-2} - 18x^2$ $= \frac{-2}{x^2} - 18x^2$
$g(x)=\frac{2x-1}{3x-5}$ $g' = \frac{(3x-5)(2)-(2x-1)(3)}{(3x-5)^2}$ $= \frac{-7}{(3x-5)^2}$	$h(x)=x\sin(4x)$ $h'(x) = x\cos 4x \cdot 4 + \sin 4x\,(1)$ $= 4x\cos 4x + \sin 4x$	

Use the graph to find each.

1. $h'(1)$ for $h(x)=f(x)\cdot g(x)$

$h'(1) = f(1)\cdot g'(1) + g(1)f'(1)$

$0 \quad (\frac{1}{2}) + (-\frac{1}{2})(-3)$

$= 3/2$

2. $h'(3)$ for $h(x)=g(f(x))$

$h'(3) = g'(f(3))\cdot f'(3)$

$g'(-2)\cdot f'(3)$

$(-1)\cdot 1 = -1$

3. $h'(-2)$ for $h(x)=\frac{f(x)}{g(x)-4}$

$h'(-2) = \frac{(g(-2)-4)f'(-2) - f(-2)g'(-2)}{(g(-2)-4)^2}$

$= \frac{(1-4)(2) - (-1)(-1)}{(1-4)^2} = \frac{(-6)-1}{9} = -7/9$