x	$f(x)$	$f'(x)$
2	6	$\frac{1}{3}$
6	8	$\frac{3}{2}$

If $\overset{f}{g}$ is the inverse of $\overset{g}{f}$ find $g'(6)$

$(2,6)$ $\overset{m}{\frac{1}{3}}$ $\qquad (6,2)$ $\overset{m}{3}$ ←

$(6,8)$ $\frac{3}{2}$ $\qquad (8,6)$ $\frac{2}{3}$

$y = f(x) = x^3 + x - 2$

g is the inverse functn

$g'(0)$

$(1,0)$ $\qquad (0,1)$

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

$f'(1) = 4$

$\boxed{g'(0) = \frac{1}{4}}$

$$\frac{d}{dx} = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

$$\lim_{h \to 0} \frac{\cos(x+h) - \cos(x)}{h} = -\sin x$$

$$\lim_{h \to 0} \frac{\cos(\frac{\pi}{2}+h) - \cos(\frac{\pi}{2})}{h}$$

$$-\sin(\tfrac{\pi}{2}) = \boxed{-1}$$

$3x^5 \quad 15x^4 \quad 15(\frac{1}{2})^4 = \frac{15}{16}$

$$\lim_{h \to 0} \frac{3(\frac{1}{2}+h)^5 - 3(\frac{1}{2})^5}{h}$$

$$\lim_{h\to 0} \frac{3\left(\frac{1}{2}\cancel{+h}\right)^5 - 3\left(\frac{1}{2}\right)^5}{h}$$

at $x=\frac{1}{2}$

$y = 3x^5$

$\boxed{y' = 15x^4}$

$15\left(\frac{1}{2}\right)^4 = \frac{15}{16}$