1.5 The Inverse Function.

The inverse fn is the opposite of its original fn.

ex: $f(x) = 2x - 3$ | $f(5) = 2(5) - 3 = 7$

$f^{-1}(x) = \dfrac{x+3}{2}$ | $f^{-1}(7) = \dfrac{7+3}{2} = \dfrac{10}{2} = 5$

$\sin^{-1}(x)$

How do we get $f^{-1}(x)$ from $f(x)$?

$$f(x) = 9x + 4.$$

how would you evaluate?

1	$\times 9$	$\div 9$ or $\times \frac{1}{9}$	2
2	$+4$	-4	1

$$f^{-1}(x) = \frac{1}{9}(x-4) \text{ or } \frac{x-4}{9}$$

$$g(x) = -2(x+3)^2 - 8$$

$+3$	-3
$(\ )^2$	$\pm\sqrt{\ }$
$x(-2)$	$\div -2$
-8	$+8$

$$g^{-1}(x) = +\sqrt{\frac{x+8}{-2}} - 3$$

$$h(x) = \frac{1}{2}\sqrt{4(x-3)} + 7$$

-3	$+3$
$\times 4$	$\div 4$
$\sqrt{}$	$(\ )^2$
$\times \frac{1}{2}$	$\div \frac{1}{2}$ or $\times 2$
$+7$	-7

$$h^{-1}(x) = \frac{\left(2(x-7)\right)^2}{4} + 3$$

$$f(x) = 2\left[-4\left(3\sqrt{x+1}\right) - 6\right]^2 + 5$$

$+1$	-1
$\sqrt{\ }$	$(\ )^2$
$\times 3$	$\div 3$
$\times(-4)$	$\div -4$
-6	$+6$
$(\ )^2$	$\sqrt{\ }$
$\times 2$	$\div 2$
$+5$	-5

$$f^{-1}(x) = \left(\frac{\dfrac{\sqrt{\dfrac{x-5}{2}}+6}{-4}}{3}\right)^2 - 1$$