4.4 NOTES APPLICATION

REVIEW SKILLS

Use the quadratic formula to solve. Express your solution(s) in exact and decimal form.

1. $2b^2 - 19 = -b$

$2b^2 + b - 19 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{-(1) \pm \sqrt{(1)^2 - 4(2)(-19)}}{2(1)}$

$= \frac{-1 \pm \sqrt{1 + 152}}{2}$

$= \frac{-1 \pm \sqrt{153}}{2}$

$x = \frac{-1 \pm 3\sqrt{17}}{2}$ (EXACT)

$x \approx -3.342,\ 2.842$ (decimal)

2. $r^2 = 2r - 8$

$r^2 - 2r + 8 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-8)}}{2(1)}$

$x = \frac{2 \pm \sqrt{4 + 32}}{2}$

$x = \frac{2 \pm \sqrt{36}}{2}$

$x = \frac{2 \pm 6}{2}$

$x = \frac{2(1 \pm 3)}{2}$

$x = 1 \pm 3$

$x = -2, 4$

4.4 Inverse Functions — NOTES — APPLICATION

1. Graph *f* and verify that *f* is one-to-one function. Find f^{-1} and add the graph of f^{-1} and the line $y = x$ to the graph *f*. State the domain and range of *f* and the domain and range of f^{-1}.

$f(x) = \sqrt{x+3} - 1$

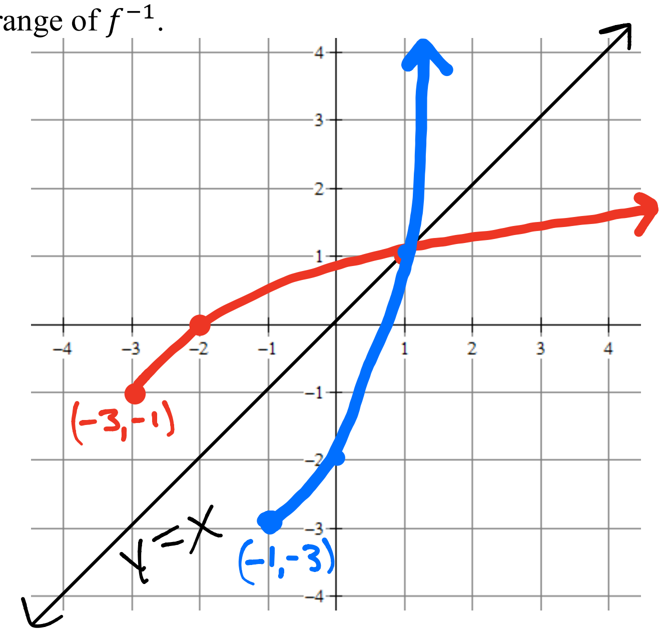
$x = \sqrt{y+3} - 1$

$x + 1 = \sqrt{y+3}$

$(x+1)^2 = y + 3$

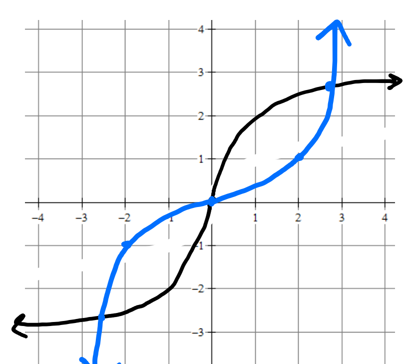
$(x+1)^2 - 3 = y$

$f^{-1}(x) = (x+1)^2 - 3,\ x \geq -1$



	f	$\boldsymbol{f^{-1}}$
D:	$[-3, \infty)$	$[-1, \infty)$
R:	$[-1, \infty)$	$[-3, \infty)$

2. The graph shows $f(x)$. On the same graph, sketch $f^{-1}(x)$.



3. Graph $f(x) = \frac{x-6}{x+6}$ in Y_1 of the graphing calculator with a "Standard Window". Find the $f^{-1}(x)$ and graph it in Y_2 of the graphing calculator. Graph $f(x) = x$ in Y_3 and us it to answer the following:

a. Explain why the functions are inverses according to your graph.

The graphs are symmetric to each other

x	$f(x)$	$f^{-1}(x)$
0	-1	6
6	0	-8.4
2	-.5	-18
-18	2	-5.368
-7.5	9	-4.588
9	.2	-7.5

b. Fill in the table and explain why they are inverses according to your table.

Points from f(x) like (6,0), (-18,2) are on $f^{-1}(x)$ in the form of (0,6) and (2,-18).

FIND $F^{-1}(x)$

$$x = \frac{y-6}{y+6}$$

$$x(y+6) = y-6$$

$$xy+6x = y-6$$

$$xy-y = -6x-6$$

$$y(x-1) = -6x-6$$

$$y = \frac{-6x-6}{x-1}$$

4. Complete the table of values given that *f* and *g* are inverse functions of each other.

$(x, f(x))$		$(x, g(x))$
(0,-2)	$\rightarrow$	(-2,0)
(1, 5)	$\rightarrow$	(5,1)
(5,2)	$\rightarrow$	(2,5)
(4,0)	$\leftarrow$	(0,4)
(3,1)	$\leftarrow$	(1, 3)
(2,3)	$\leftarrow$	(3, 2)
(7,4)	$\leftarrow$	(4,7)

x	$f(x)$	$g(x)$
0	-2	4
1	5	3
2	3	5
3	1	2
4	0	7
5	2	1