12.1
p. 813

ex 10

$\{(-1, 3), (0, 5), (5, 0), (7, -\frac{1}{2})\}$

function

each x is assigned exactly one y.

passes vertical line test

one to one function
"1-1"

each y is assigned exactly one x

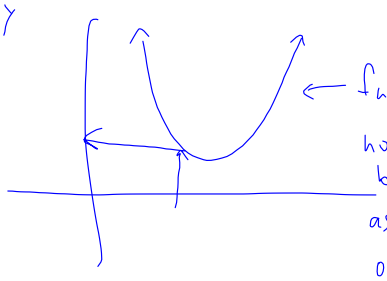
passes the horizontal line test

is one to one also

inverse

switch x & y

$\{(3, -1), (5, 0), (0, 5), (-\frac{1}{2}, 7)\}$



← function, but not one to one because a y is assigned to more than one x.

Apr 27-6:32 PM

ex 12

$\{(-8, 6), (-4, 3), (0, 6), (5, 10)\}$

function is not one to one

like test

$\{(2, 3), (3, 7), (1, 4)\}$ is one to one.

inverse: $\{(3, 2), (7, 3), (4, 1)\}$

domain of inverse: $\{3, 7, 4\}$

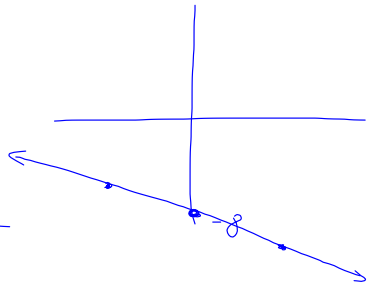
range of inverse: $\{2, 3, 1\}$

Apr 27-6:45 PM

ex 16 $f(x) = -\frac{1}{4}x - 8$

is a one to one function

$y = -\frac{1}{4}x - 8$



inverse $x = -\frac{1}{4}y - 8$

$+8 \qquad +8$

$-4(x+8) = -\frac{1}{4}y \cdot (-4)$

$-4x - 32 = y$

$f^{-1}(x) = -4x - 32$

"f inverse of x"

$f(x) = x^3$

$f^{-1}(x) = \sqrt[3]{x}$

$f(4) = 4^3 = 64$

$f^{-1}(64) = \sqrt[3]{64} = 4$

test → domain & range of inverse

$(-\infty, \infty)$ $(-\infty, \infty)$

Apr 27-6:50 PM

ex 18 $f(x) = 3x + 1$ ← $D = (-\infty, \infty)$ x

$y = 3x + 1$ ← $R = (-\infty, \infty)$ y

is one to one

inverse $x = 3y + 1$

$-1 \qquad -1$

$x - 1 = 3y$

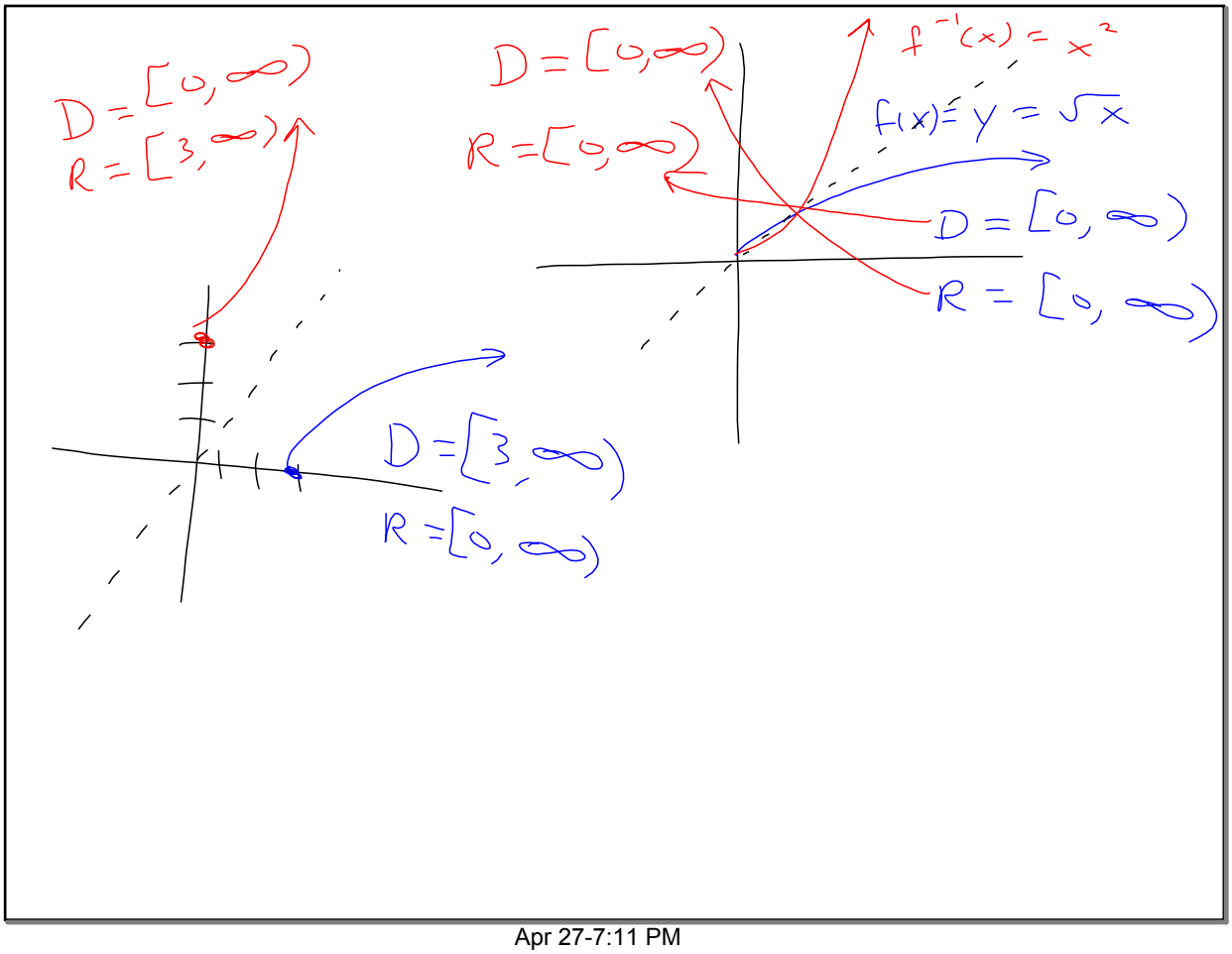
$\frac{x-1}{3} = y$ or $y = \frac{x}{3} - \frac{1}{3}$ or $y = \frac{1}{3}x - \frac{1}{3}$

$D = (-\infty, \infty)$

$R = (-\infty, \infty)$

$f^{-1}(x) = \frac{1}{3}x - \frac{1}{3}$

Apr 27-7:06 PM



Apr 27-7:11 PM

ex 20 $f(x) = \sqrt{x+2}$, $x \geq -2$

is 1-1. ↓ $D = [-2, \infty)$

$y = \sqrt{x+2}$

---

inverse $x = (\sqrt{y+2})^2$

$x^2 = y + 2$

$-2 \quad -2$

$x^2 - 2 = y$

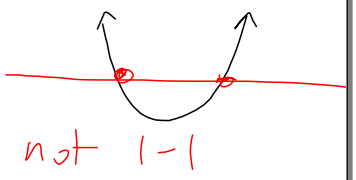
$f^{-1}(x) = x^2 - 2$

$D = (-\infty, \infty)$

$R = [-2, \infty)$

Apr 27-7:15 PM

ex 22 $f(x) = 4x^2 - 1$ ←



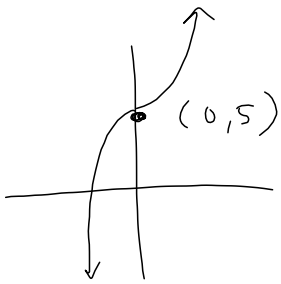
not 1-1

Stop

Apr 27-7:20 PM

ex 24 $f(x) = x^3 + 5$

is one to one



inverse $x = y^3 + 5$

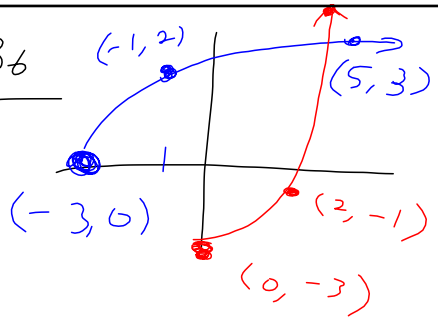
$-5 \quad -5$

$\sqrt[3]{x-5} = \sqrt[3]{y^3}$

$\sqrt[3]{x-5} = y$ $f^{-1}(x) = \sqrt[3]{x-5}$

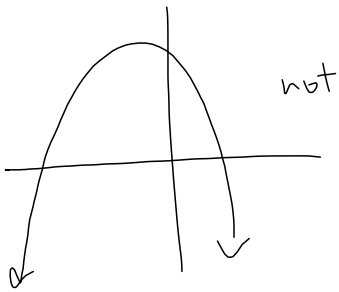
Apr 27-7:21 PM

ex 36

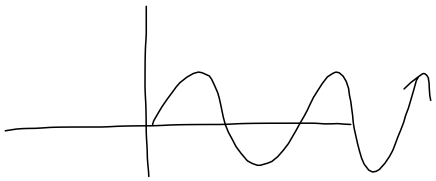


is 1-1.

ex 38

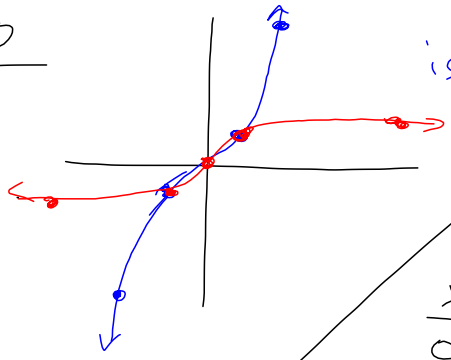


not 1-1.



Apr 27-7:26 PM

ex 40



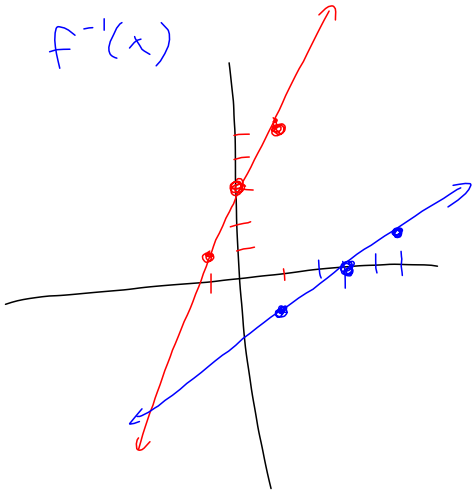
is 1-1.

ex 42

$f(x) = 2x + 3$

$f^{-1}(x)$

x	y
0	3
1	5
-1	1

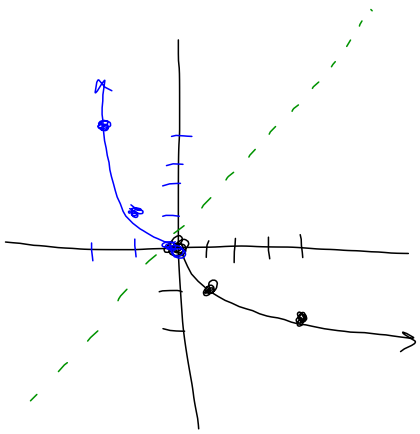


Apr 27-7:30 PM

ex 46 $f(x) = -\sqrt{x}$

$x \geq 0$

x	y
0	0
1	-1
4	-2



$f^{-1}(x)$

x	y
0	0
-1	1
-2	4

Apr 27-7:37 PM

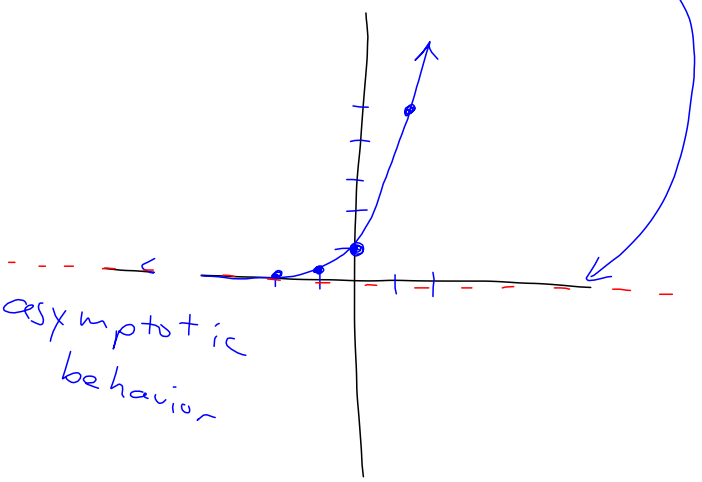
12.2 p. 821

ex 20 $f(x) = 5^x$

x	y
-2	$\frac{1}{25}$
-1	$\frac{1}{5}$ $\leftarrow 5^{-1}$
0	1
1	5
2	25

asymptote

asymptotic behavior

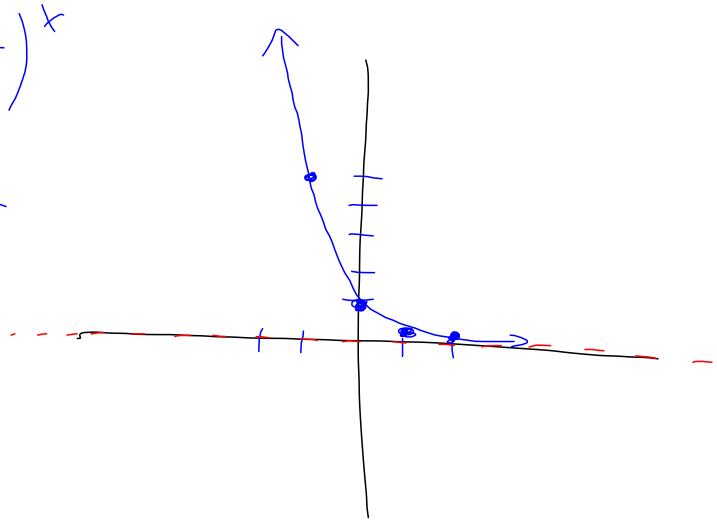


Apr 27-7:41 PM

ex 22 $g(x) = \left(\frac{1}{5}\right)^x$

x	y
-2	25
-1	5
0	1
1	$\frac{1}{5}$
2	$\frac{1}{25}$

$\left(\frac{1}{5}\right)^{-2}$



Apr 27-7:50 PM

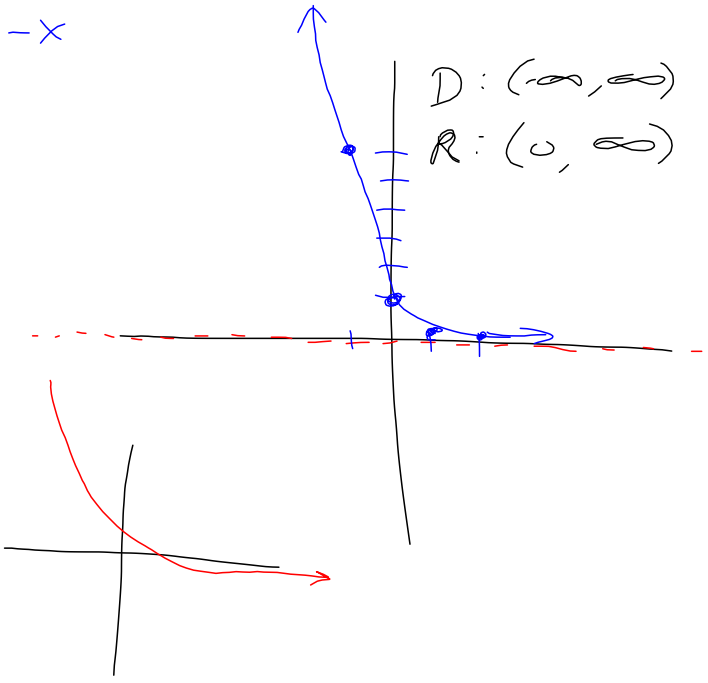
ex 24 $f(x) = 6^{-x}$

x	y
-2	36
-1	6
0	1
1	$\frac{1}{6}$
2	$\frac{1}{36}$

$6^{-(-1)}$

D: $(-\infty, \infty)$

R: $(0, \infty)$



Apr 27-7:53 PM

ex 26 $f(x) = 2^{(2x+1)}$

x	y
-2	$\frac{1}{8}$
-1	$\frac{1}{2}$
$-\frac{1}{2}$	1
0	2
$\frac{1}{2}$	4
1	8
$\frac{3}{2}$	16
2	32

2^{-4+1} 2^{-3}

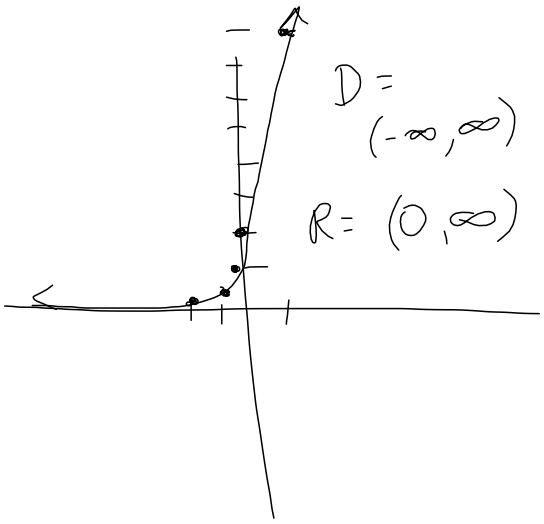
$2^{-2+1} = 2^{-1}$

$2^{-1+1} = 2^{0}$

2^{0+1} 2^{1+1}

2^{2+1}

2^{4+1}



Apr 27-7:56 PM

ex 28 $8^x = 64$

$8^x = 8^2$

$x = 2$

$8^x = 64$

$(2^3)^x = 2^6$

$2^{3x} = 2^6$

$3x = 6$

$x = 2$

Apr 27-8:04 PM

ex 30 $8^x = 4$

$(2^3)^x = 2^2$

$2^{3x} = 2^2$

$3x = 2$

$x = \frac{2}{3}$

ex 32 $9^{2x-8} = 27^{x-4}$

$(3^2)^{2x-8} = (3^3)^{x-4}$

$9^0 \quad 27^0$

$1 = 1$

$3^{4x-16} = 3^{3x-12}$

$4x - 16 = 3x - 12$

$+16 \quad -3x \quad +16$

$x = 4$

Apr 27-8:08 PM

ex 34 $3^x = \frac{1}{81}$

$3^x = \frac{1}{3^4}$

$3^x = 3^{-4}$

$x = -4$

ex 36 $10^x = 0.1$

$10^x = \frac{1}{10}$

$10^x = 10^{-1}$

$x = -1$

Apr 27-8:13 PM

ex 38

$$\left(\frac{4}{3}\right)^x = \frac{27}{64}$$

$$\left(\frac{4}{3}\right)^x = \left(\frac{3}{4}\right)^3$$

$$\left(\frac{4}{3}\right)^x = \left(\frac{4}{3}\right)^{-3}$$

$x = -3$

Apr 27-8:17 PM