5^{1-x}

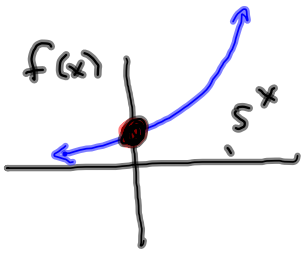
$x \longrightarrow -x+1$

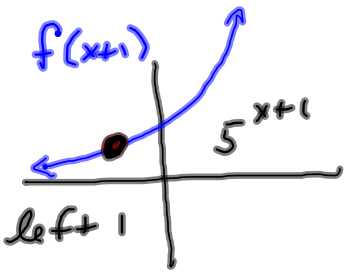
① $1-x = -x+1$

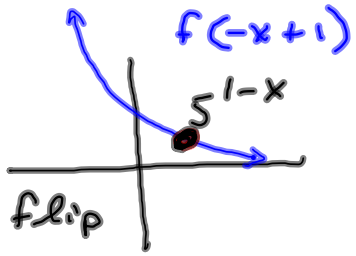
$x \longrightarrow x+1 \longrightarrow -x+1$

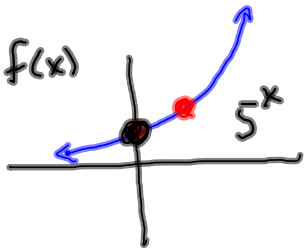
$f(x) = 5^x \longrightarrow f(x+1) = 5^{x+1} \longrightarrow 5^{-x+1} = f(-x+1)$

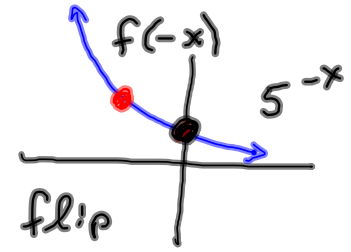
left 1 — horizontal reflection

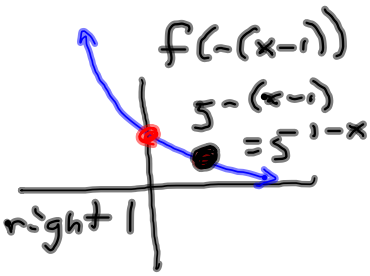












$1-x = -(-1+x) = -(x-1)$

$x \longrightarrow -x \longrightarrow -(x-1)$

$f(x) = 5^x \longrightarrow f(-x) = 5^{-x} \longrightarrow f(-(x-1)) = 5^{-(x-1)}$

flip horizontal — right 1

Find the inverse of $g(x) = -5^{1-x} + 7$

$x = -5^{1-y} + 7 = x$

$-5^{1-y} = x - 7$

$5^{1-y} = -x + 7$

$\log_5(5^{1-y}) = \log_5(7-x)$

$1 - y = \log_5(7-x)$

Don't take $\log_{-5}(*)$

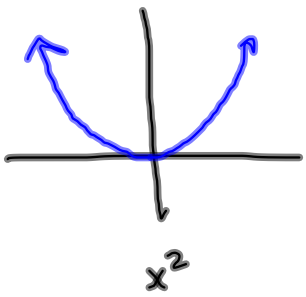
$-y = \log_5(7-x) - 1$

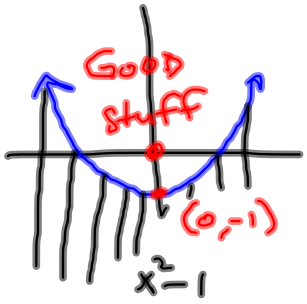
$y = -\log(7-x) + 1 = f^{-1}(x)$

§5.5

Recall a function's graph divides the plane in two halves. Inequalities have a good side & bad side. I scratch out the bad side.

$y > x^2 - 1$





Determine good stuff with test value(s)

(0,0):

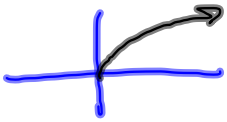
$0 > 0^2 - 1 = -1$

Yes

(0,0) Good

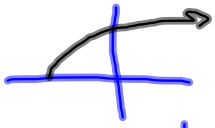
Tarzan like. Scratch away from (0,0)

$y \geq \sqrt{3-x} - 7$



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

left 3

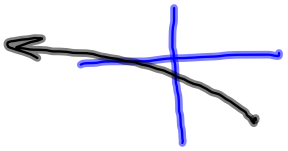


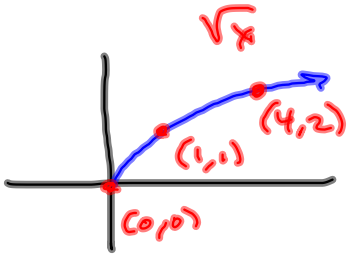
$\longrightarrow f(-x+3) = \sqrt{-x+3} = \sqrt{3-x}$

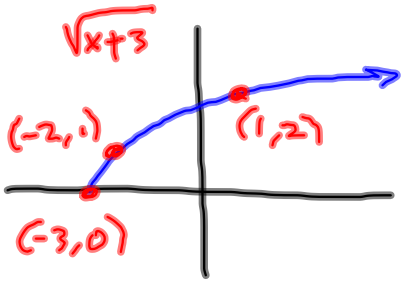
flip it

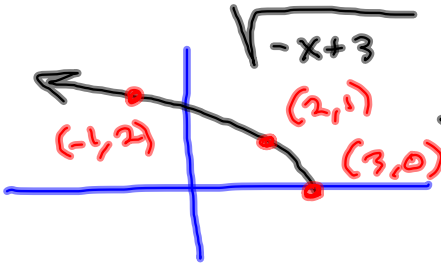
$\longrightarrow f(3-x) - 7 = \sqrt{3-x} - 7$

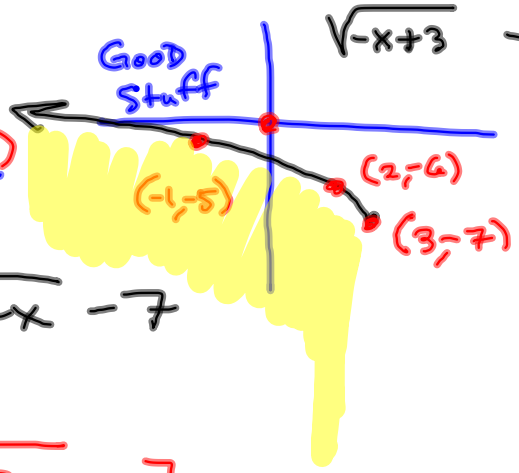
Down 7











$y \geq \sqrt{3-x} - 7$

$(0,0)$:

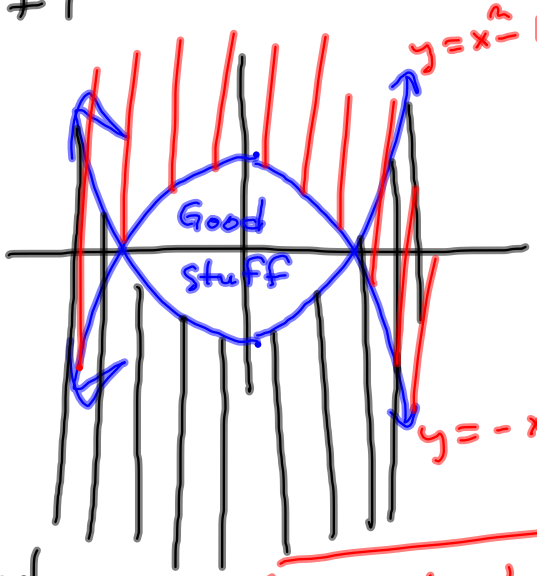
$0 \geq \sqrt{3} - 7$

Yes $(0,0)$ good

$y \geq x^2 - 1$

$y \leq -x^2 + 1$

Graph the system



$y \geq x^2 - 1$
Good above
Scratch out
below

$y \leq -x^2 + 1$
Good below
Scratch out
above

Don't sweat
$>$ -vs- $\geq$
dotted line
solid line

Just do solid lines for your curves

§6.1 Gaussian Elimination

Two recipes:

2x2 : 473

3x3 : 476

Solve the system using Gaussian Elimination

$x - y = 2$
$3x - y = 12$

$$\left[\begin{array}{cc|c} 1 & -1 & 2 \\ 3 & -1 & 12 \end{array}\right] \quad -3R1+R2 \longrightarrow R2$$

$$\begin{array}{cc|c} -3 & 3 & -6 \\ 3 & -1 & 12 \\ \hline 0 & 2 & 6 \end{array}$$

$x - y = 2$
$2y = 6$

$$\left[\begin{array}{cc|c} 1 & -1 & 2 \\ 0 & 2 & 6 \end{array}\right] \quad \tfrac{1}{2}R2 \longrightarrow R2$$

$x - y = 2$
$y = 3$

$$\left[\begin{array}{cc|c} 1 & -1 & 2 \\ 0 & 1 & 3 \end{array}\right] \quad R2+R1 \longrightarrow R1$$

$x = 5$
$y = 3$

$$\left[\begin{array}{cc|c} 1 & 0 & 5 \\ 0 & 1 & 3 \end{array}\right]$$

Basic Scheme (See pg 473)

$$\left[\begin{array}{cc|c} \triangle & \diamond & \square \\ \bigcirc & \triangle & \square \end{array}\right] \sim \left[\begin{array}{cc|c} 1 & \frac{\diamond}{\triangle} & \frac{\square}{\triangle} \\ \bigcirc & \triangle & \square \end{array}\right] \sim$$

$$\left[\begin{array}{cc|c} 2 & 4 & 6 \\ 7 & 8 & 9 \end{array}\right] \sim \left[\begin{array}{cc|c} 1 & 2 & 3 \\ 7 & 8 & 9 \end{array}\right]$$

$$\left[\begin{array}{cc|c} * & * & * \\ * & * & * \end{array}\right] \sim \left[\begin{array}{cc|c} 1 & * & * \\ * & * & * \end{array}\right] \sim$$

$$\left[\begin{array}{cc|c} 1 & * & * \\ 0 & * & x \end{array}\right] \sim \left[\begin{array}{cc|c} 1 & * & * \\ 0 & 1 & * \end{array}\right] \sim \left[\begin{array}{cc|c} 1 & 0 & \bigcirc \\ 0 & 1 & \star \end{array}\right]$$

1's on diagonal are nice!

0's off diagonal are nice!

$x = \bigcirc$
$y = \star$

§6.1 Due Wed.

#s 35, 39, 43, 52, 59, 67, 69

↳ Setup Only:
Variables
System
Augmented Matrix