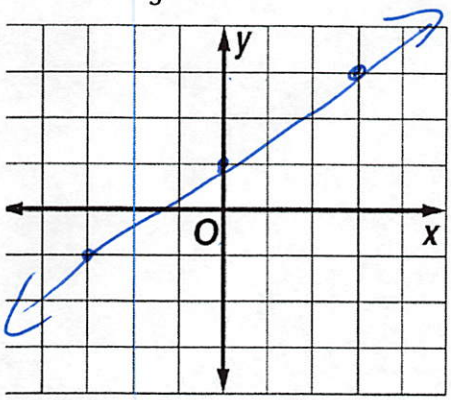
Notes 3.1A Solving Systems of Equations
(linear and non-linear)

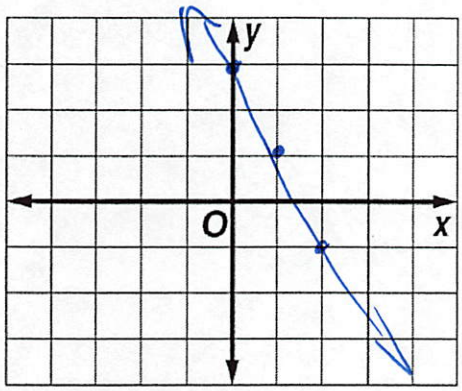
Solve systems of equations:

- What it means to solve a system of equations
- Graphing without a calculator.
- Graphing with a calculator.

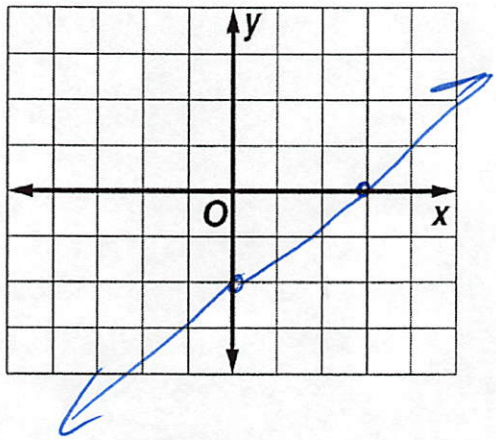
$y = \frac{2}{3}x + 1$ $y=mx+b$ m; slope b; y-int



$y = -2x + 3$ find intercepts:



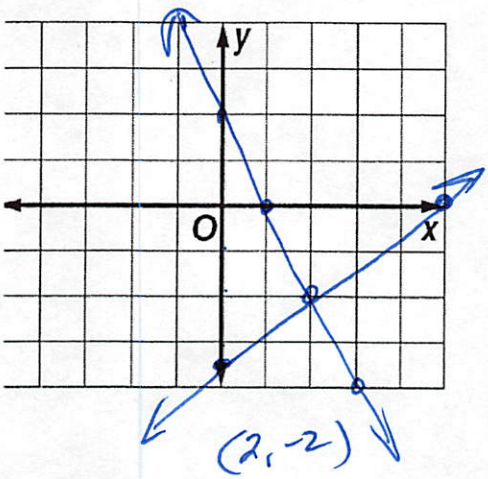
$2x - 3y = 6$ $x=3$ $y=-2$



Solve a system by graphing:

$4x + 2y = 4$
$2x - 3y = 10$

$x=1, y=2$
$x=5, y=-\frac{10}{3}$

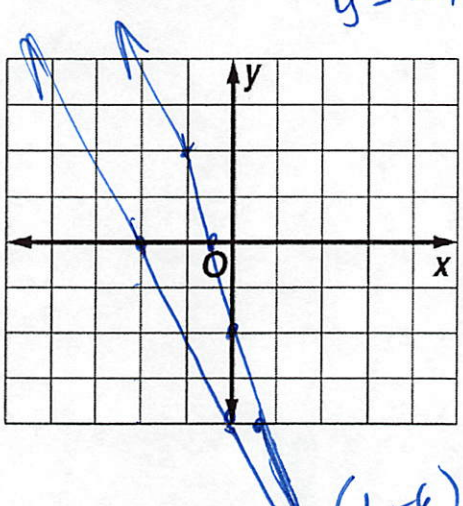


(2, -2)

Check
$4(2)+2(-2)=4$ ✓
$2(2)-3(-2)=10$ ✓

$4x + y = -2$
$-6x - 3y = 12$

$x=-1/2$
$y=-2$
$x=-2$
$y=-4$



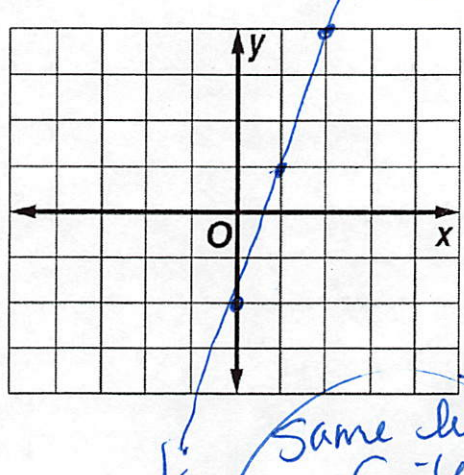
(1, -6)

$4(1)+(-6)=-2$ ✓
$-6(1)-3(-6)=12$ ✓

$y = 3x - 2$
$6x - 2y = 4$

or $y = 3x - 2$

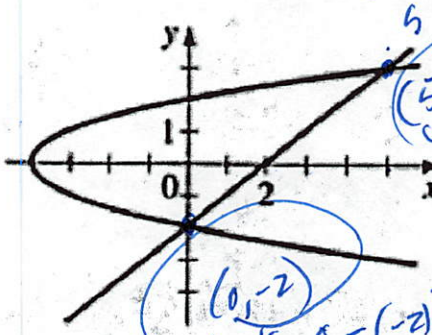
$x=\frac{2}{3}$
$y=-2$



Same line infinite solutions

Solve a system by graphing (non-linear)

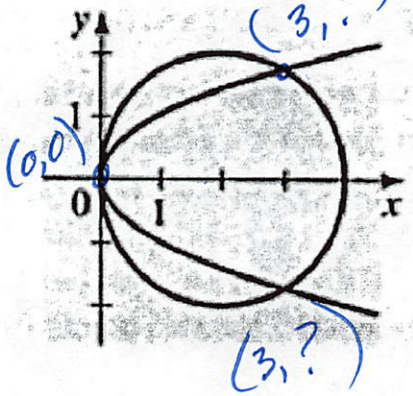
20. $\begin{cases} x - y^2 = -4 \\ x - y = 2 \end{cases}$



$5-(3)^2=-4$ ✓
$5-3=2$ ✓
$(5,3)$
$(0,-2)$
check $0-(-2)^2=-4$ ✓
$0-(-2)=2$ ✓

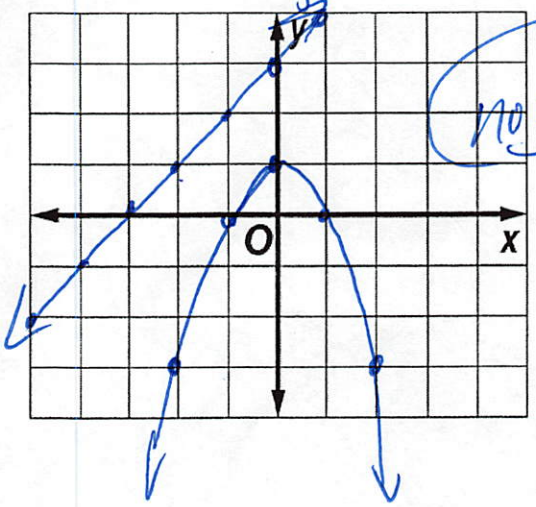
22. $\begin{cases} x^2 + y^2 = 4x \\ x = y^2 \end{cases}$

$3^2+(\sqrt{3})^2=4(3)$ ✓
$(3,\sqrt{3})$
$(3,-\sqrt{3})$



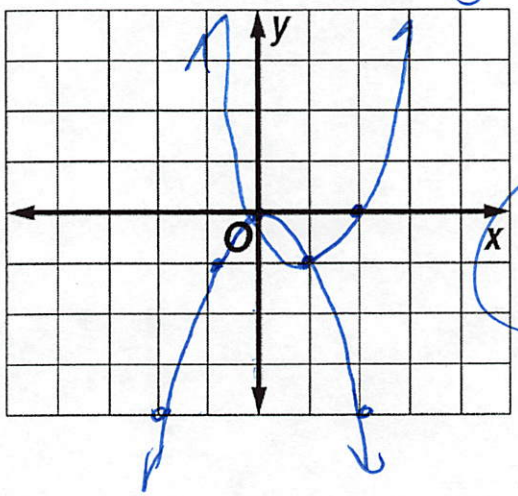
so put 3 in for x and solve for y
$3=y^2$
$y=\pm\sqrt{3}$

$x^2 + y = 1$ $\quad y=-x^2+1$
$x - y = -3$ $\quad y=x+3$



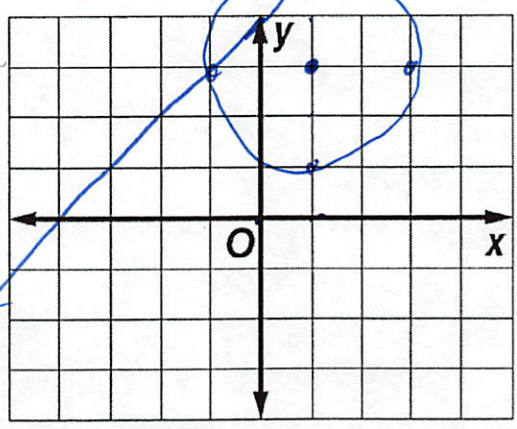
No sol

$x^2 + y = 0$ $\quad y=-x^2$
$x^2 - 2x - y = 0$ $\quad y=x^2-2x$
$y=x(x-2)$



$(0,0)$
$(1,-1)$

$(x-1)^2 + (y-3)^2 = 4$
$x - y = -4$ $\quad y=x+4$



$(-1,3)$
$(-1-1)^2+(3-3)^2=4$ ✓
$-1-3=-4$ ✓
$(1,5)$
$(1-1)^2+(5-3)^2=4$ ✓
$1-5=-4$ ✓

$(-1,3)$
$(1,5)$