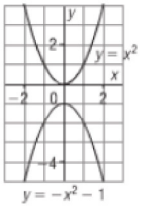
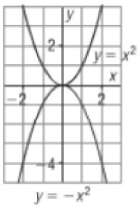
Lesson 6 Solving Systems of Equations Algebraically again

A quadratic-quadratic system of equations may have 0, 1, 2 or infinite solutions. The solution is a set of ordered pairs that satisfies both equations (where the graphs intersect).

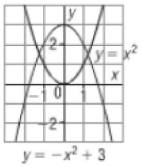
This system has 0 solutions.



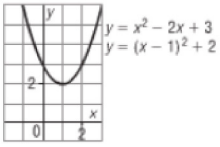
This system has 1 solution.



This system has 2 solutions.



This system has infinite solutions.



Example 1
Solve this system.

$y + 2x = x^2 - 6$

$x + y - 3 = 2x^2$

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

$x + x^2 - 2x - 6 - 3 = 2x^2$

$0 = x^2 + x + 9$ ← doesn't PSF, use quadratic formula

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

$x = \dfrac{-1 \pm \sqrt{1^2 - 4(1)(9)}}{2(1)}$

$x = \dfrac{-1 \pm \sqrt{-35}}{2}$ ← discriminant is -ve

$\Delta = -35$

∴ no real roots exist

No sol'n

Example 2
Solve.

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

$y = x^2 - 4x - 5$

$(x+2)^2 - 1 = x^2 - 4x - 5$ $(x+2)(x+2)$ FOIL

$x^2 + 4x + 4 - 1 = x^2 - 4x - 5$

$8x + 3 = -5$

$8x = -8$

$x = -1$

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

$y = 0$

$\therefore$ sol'n $(-1, 0)$

Example 3
Solve.

elimination add/subtract

$y = x^2 + 8x + 15$

$-(y = -2x^2 - 16x + 33)$

$0 = 3x^2 + 24x - 18$

$\div 3$ $0 = x^2 + 8x - 6$

$x = \frac{-8 \pm \sqrt{8^2 - 4(1)(-6)}}{2(1)}$

$x = \frac{(-8 \pm \sqrt{88})}{2}$

$x = 0.69041576...$ $x = -8.69041576...$

sub in to get y

$y = 21$ $y = 21$

Assignment: Pg. 399 #7b, 8, 9a, 10

Review pg 408

Practice Test pg 415