IDENTIFYING CONICS

1) Identify conics from equation
2) Solve quadratic systems of eq.

P 1) $x = 5 - 3(y+2)^2$

Hyp 2) $\frac{x^2}{9} - \frac{(y+3)^2}{4} = 1$

Ell. 3) $\frac{x^2}{9} + \frac{(y-2)^2}{4} = 1$

Circle 4) $\frac{x^2}{9} + \frac{(y-2)^2}{9} = 1$

Ell. 5) $3x^2 + 7x - 4y + 2y^2 = 11$

Par. 6) $2x^2 - 5y = 3x + 14 - 3x^2$

Hyp. 7) $9x^2 - 2x + 1 = 3y^2 + 2y$
$9x^2 - 3y^2$

Circle 8) $2 - 4y + 7y^2 = 5x + 3 - 7x^2$
$7y^2 + 7x^2$

DO NOT WRITE THESE RULES ON YOUR CARD!

Parabola – one squared variable

Hyperbola – two squared variables with opposite signs

Circle – two squared vars. with same signs & same coeff.

Ellipses – two squared vars with same signs & different coeff.

Solving Systems of Quadratic Equations

Hyp $5x^2 - 3y^2 = -28$

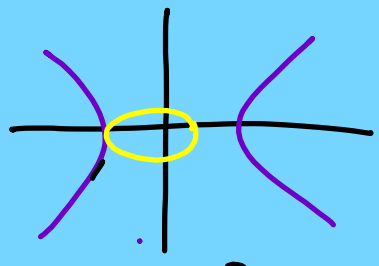
Ell $2x^2 + y^2 = 24$] 3

Elimination--Variables must have the same exponents.

$$5x^2 - 3y^2 = -28$$
$$+\ 6x^2 + 3y^2 = 72$$
$$\frac{11x^2}{11} = \frac{44}{11}$$
$$\sqrt{x^2} = \sqrt{4}$$
$$x = \pm 2$$

$(2,4)\ (2,-4)$

$(-2,4)\ (-2,-4)$



$x = 2$ $\quad 2x^2 + y^2 = 24$

$2(2)^2 + y^2 = 24$

$8 + y^2 = 24$

$\sqrt{y^2} = \sqrt{16}$

$y = \pm 4$

Substitution--Variables do NOT have the same exponents.

KEY: Isolate a variable which has no exponent!

Ell $x^2 + 9y^2 = 25$

Line $2y = 1 - x$

$x = 1 - 2y$

$(1-2y)^2 + 4y^2 = 25$

$(1-2y)(1-2y)$

$1 - 2y - 2y + 4y^2 + 4y^2 = 25$

$8y^2 - 4y + 1 = 25$

$-25 \quad -25$

$8y^2 - 4y - 24 = 0$

$4(2y^2 - y - 6) = 0$ $\quad 16$, 23

$4(2y+3)(y-2) = 0$

$+3y$

$-4y$

$2y + 3 = 0$ $\quad y - 2 = 0$

$2y = -3$ $\quad y = 2$

$y = -3/2$

$x = 1 - 2y$

$y = -3/2 \quad x = 1 - 2\left(\frac{-3}{2}\right)$

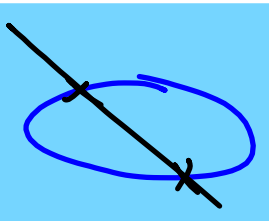
$x = 4$

$y = 2 \quad x = 1 - 2(2)$

$x = -3$

$(4, -3/2)$

$(-3, 2)$



No solution

Variables will cancel

$x^2 + 4 = x^2 - 8$

$4 = -8$

$\sqrt{x^2} = \sqrt{-7}$

imaginary = no sol.

Infinitely Many

Variables cancel

$7 = 7$

$0 = 0$

Calculator

Change entry mode = Menu – 3 – 3 – 61

$5x^2 - 3y^2 = -28$

$5x^2 - 3y^2 + 28 = 0$