Conic Systems of Equations   28

No solution   One solution   Two solutions   Three solutions   Four solutions
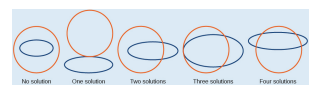
Algebraic methods:

1. Substitution&   2. Elimination (or Combination

1. $y = x^2$ <u>Substitution Method</u>

   $y = 3x - 2$

1. Choose 1 eq. to solve for 1 variable	2. Substitute that eq. from step 1 into the other equation for the variable & solve
already solved $y = x^2$	$y = 3x - 2$ $x^2 = 3x - 2$ quad eq. set = 0 $x^2 - 3x + 2 = 0$ factor $(x-2)(x-1) = 0$ $x - 2 = 0 \quad x - 1 = 0$ $x = 2 \quad x = 1$
3. Substitute what you just found in step 2 into the eq above (from step 1)	4. Write as an ordered pair & check in both original equations.
$y = x^2 \quad y = x^2$ $y = (2)^2 \quad y = (1)^2$ $y = 4 \quad y = 1$	$(2, 4) \; \& \; (1, 1)$

2. $y - 2x - 3 = 0$

   $x^2 - y = 0$

$y - 2x - 3 = 0$ $x^2 - y = 0$
$y = 2x + 3$ $x^2 - (2x + 3) = 0$
                        $x^2 - 2x - 3 = 0$
                        $(x - 3)(x + 1) = 0$
                        $x - 3 = 0 \quad x + 1 = 0$
                        $x = 3 \quad x = -1$

$y = 2x + 3 \quad y = 2x + 3$
$y = 2(3) + 3 \quad y = 2(-1) + 3$
$y = 9 \quad y = 1$ $(3, 9) \; (-1, 1)$

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3. $x - y = 4$ <u>Elimination Method</u>

   $3x^2 - x + y = 8$

1. Line up like terms & =
2. Get either x or y to have opposites coefficients.
3. Add & solve after 1 variable cancels.
4. Substitute into either equation to find the other variable.
5. Write as an ordered pair & check

$x - y = 4$
$3x^2 - x + y = 8$

$\dfrac{3x^2}{3} = \dfrac{12}{3}$

$\sqrt{x^2} = \pm\sqrt{4}$

$x = \pm 2$

$x - y = 4 \qquad x - y = 4$
$2 - y = 4 \qquad -2 - y = 4$
$-y = 2 \qquad -y = 6$
$y = -2 \qquad y = -6$

$(2, -2) \; (-2, -6)$

4. $3x^2 + y^2 = 48$

   $x^2 = 2y^2 + 16$

$2(3x^2 + y^2 = 48) \rightarrow 6x^2 + 2y^2 = 96$
$x^2 - 2y^2 = 16 \rightarrow + \; x^2 - 2y^2 = 16$

$\dfrac{7x^2}{7} = \dfrac{112}{7}$

$\sqrt{x^2} = \pm\sqrt{16}$

$X = \pm 4$

$3x^2 + y^2 = 48 \quad 3x^2 + y^2 = 48$
$3(4)^2 + y^2 = 48 \quad 3(-4)^2 + y^2 = 48$
$48 + y^2 = 48 \quad 48 + y^2 = 48$
$y^2 = 0 \quad y^2 = 0$
$y = 0 \quad y = 0$

$(4, 0) \; (-4, 0)$

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Project due by Sun. 8PM

HW: 2 wksts
- all of classifying
- systems (omit 12, 16, 18)

Mon - Review

Aug 18-9:24 AM

15. $y^2 - 4x^2 = 25$
$4x^2 + y^2 = 25$

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18. $x^2 + y^2 = 25$

$\dfrac{x^2}{16} + \dfrac{y^2}{25} = 1$

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