

$$(34) \quad 32x^2 - 48xy + 18y^2 - 15x - 20y = 0$$

HW# 9.4-3

$$(1) \quad 48^2 - 4 \cdot 32 \cdot 18 = 0 \quad \boxed{\text{Parabola}}$$

$$(2) \quad \tan 2\theta = \frac{-48}{14} = \boxed{\frac{-24}{7}}$$

$$2\theta = -73 + 180 = 106^\circ$$

$$\boxed{\theta = 53^\circ}$$



$$-\frac{7}{25} = 2 \cos^2 \theta - 1$$

$$\frac{18}{25} = 2 \cos^2 \theta$$

$$\frac{9}{25} = \cos^2 \theta$$

$$\boxed{\frac{3}{5} = \cos \theta}$$

$$-\frac{7}{25} = 1 - 2 \sin^2 \theta$$

$$-\frac{32}{25} = -2 \sin^2 \theta$$

$$\frac{16}{25} = \sin^2 \theta$$

$$\boxed{\frac{4}{5} = \sin \theta}$$

$$x = \frac{3x' - 4y'}{5}$$

$$y = \frac{4x' + 3y'}{5}$$

$$(4) \quad 32 \left(\frac{3x-4y}{5} \right)^2 - 48 \left(\frac{3x-4y}{5} \right) \left(\frac{4x+3y}{5} \right) + 18 \left(\frac{4x+3y}{5} \right)^2 - 15 \left(\frac{3x-4y}{5} \right)$$

$$-20 \left(\frac{4x+3y}{5} \right) = 0$$

$$32 \left(\frac{9x^2 - 24xy + 16y^2}{25} \right) - 48 \left(\frac{12x^2 - 7xy - 12y^2}{25} \right) + 18 \left(\frac{16x^2 + 24xy + 9y^2}{25} \right)$$

$$-15 \left(\frac{3x-4y}{5} \right) - 20 \left(\frac{4x+3y}{5} \right) = 0$$

$$32(9x^2 - 24xy + 16y^2) - 48(12x^2 - 7xy - 12y^2) + 18(16x^2 + 24xy + 9y^2) - 75(3x - 4y)$$

$$-100(4x+3y) = 0$$

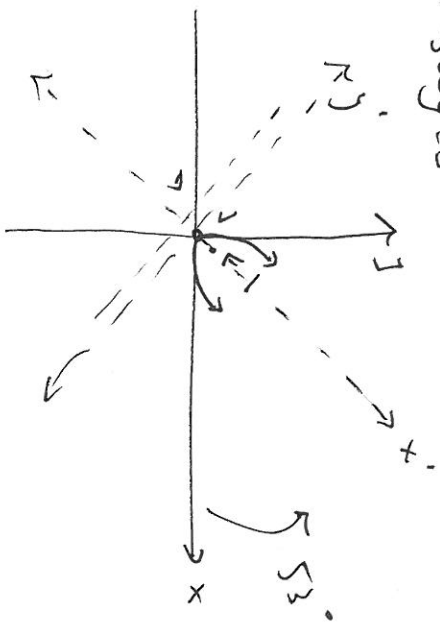
$$288x^2 - 768xy + 512y^2 - 576x^2 + 336xy + 576y^2 + 288x^2 + 432xy + 162y^2 - 225x + 300y - 400x - 300y = 0$$

$$1250y^2 - 225x + 300y - 400x - 300y = 0$$

$$1250y^2 - 625x = 0$$

$$1250y^2 = 625x$$

$$\boxed{(y')^2 = \frac{1}{2} x'}$$



37 $34x^2 - 24xy + 41y^2 - 25 = 0$

① Ellipse

② $\tan 2\theta = \frac{-24}{34-41} = \left[\frac{24}{7} \right]$

$2\theta = 73^\circ$

$\theta = 37^\circ$



$\cos 2\theta = \frac{7}{25}$

$\frac{7}{25} = 2\cos^2\theta - 1$

$\frac{32}{25} = 2\cos^2\theta$

$\frac{16}{25} = \cos^2\theta$

$\left[\frac{4}{5} = \cos\theta \right]$

$\left[\frac{3}{5} = \sin\theta \right]$

③ $\begin{cases} x = \frac{4x' - 34y'}{5} \\ y = \frac{3x' + 4y'}{5} \end{cases}$

$34x^2 - 24xy + 41y^2 = 25$

$34\left(\frac{4x'-34y'}{5}\right)^2 - 24\left(\frac{4x'-34y'}{5}\right)\left(\frac{3x'+4y'}{5}\right) + 41\left(\frac{3x'+4y'}{5}\right)^2 = 25$

$34\left(\frac{16x'^2 - 24x'y' + 9y'^2}{25}\right) - 24\left(\frac{12x'^2 + 7x'y' - 12y'^2}{25}\right) + 41\left(\frac{9x'^2 + 24x'y' + 16y'^2}{25}\right) = 25$

$34(16x'^2 - 24x'y' + 9y'^2) - 24(12x'^2 + 7x'y' - 12y'^2) + 41(9x'^2 + 24x'y' + 16y'^2) = 625$

$544x'^2 - 816x'y' + 306y'^2 - 288x'y' - 168x'y' + 288y'^2 + 369x'^2 + 984x'y' + 656y'^2 = 625$

$625x'^2 + 1250y'^2 = 625$

$\frac{x'^2}{1} + \frac{2y'^2}{1} = 1$

$\left[\frac{(x')^2}{1} + \frac{(y')^2}{\frac{1}{2}} = 1 \right]$

