

1) List all possibilities of what the graph of $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$ can be if

- (a) $B^2 - 4AC = 0$ and $\Delta \neq 0$?
- (b) $B^2 - 4AC > 0$ and $\Delta \neq 0$?
- (c) $B^2 - 4AC < 0$ and $\Delta \neq 0$?
- (d) $B^2 - 4AC < 0$ and $\Delta = 0$?
- (e) $B^2 - 4AC > 0$ and $\Delta = 0$?

2) Find $B^2 - 4AC$ & Δ for $x^2 + 2xy + 6y = 0$, what is the graph?

3.) Graph $r = 1 + \cos \theta$ 4.) Graph $r = \sin 4\theta$

5 a) Change $(r, \theta) = (2, -\frac{\pi}{3})$ into rectangular co-ordinates

b) Change $(x, y) = (-1, \sqrt{3})$ into polar co-ordinates

6 a) Change the equation $x^2 + 2xy - y^2 = 1$ into polar co-ordinates

b) Change the equation $r = \frac{\tan \theta}{\csc \theta}$ into rectangular co-ordinates

7. Find the polar co-ordinates of the points of intersection of the graphs of $r = 1 - \cos \theta$ and $r = \cos \theta$

8. Factor $2x^2 - 4xy - 6y^2 + 3x + 7y - 2$ into a product of linear terms.

9. Find the polar co-ordinates of the points of intersection of the graphs of $r = \cos 3\theta$ and $r^2 - r = 0$

10. For the equation $3xy - 4y^2 - 18 = 0$, Find the rotated form of the equation (in terms of x' & y') which make $B'x'y' = 0$. Find a, b, c in the rotated form. Graph this equation clearly labeling the x, y, x' & y' axis's, Include on your graph any asymptotes.