

Practice Questions for Conic Sections

Question 1. Which of the following are a parabola, circle, ellipse and hyperbola:

- a) $x^2 + y^2 = 1$ (*June 2006*)
- b) $y^2 = 8x$
- c) $16x^2 + 25y^2 = 400$ (*June 2007*)
- d) $2x^2 - y^2 = 4$

Is the equation in the standard form? If Not, rewrite it in the standard form.

Question 2. State the parametric form, eccentricity, foci, directrices and asymptotes for curves in b, c and d above and sketch the curves.

Question 3. Justify that

- a) $(2t^2, 4t)$ is a parametric form of $y^2 = 8x$.
- b) $(5\cos\theta, 4\sin\theta)$ is a parametric form of $16x^2 + 25y^2 = 400$ (or $\frac{x^2}{25} + \frac{y^2}{16} = 1$).
- c) $(\sqrt{2}\sec\theta, 2\tan\theta)$ is a parametric form of $2x^2 - y^2 = 4$ (or $\frac{x^2}{2} - \frac{y^2}{4} = 1$).

Task 4. Complete the practice questions in your handout (Q1-7).

Task 5. Attempt June 2007 question 5.

Question 6. What curves are the following

- a) $2x^2 - 4x - y^2 - 4y = 4$ (*June 2006*).
- b) $2x^2 + 3y^2 - 4x + 12y + 8 = 0$ (*June 2011*).
- c) $y^2 - 2y - 8x + 25 = 0$ (*June 2012*).
- d) $x^2 + 8y = 0$ (*June 2010*).

Find directrices, foci and asymptotes for the above curves.

Task 7. Attempt June 2010 question.