AP PRECALCULUS • EXERCISE SHEET

4.6 Conic Sections

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS conic section 圆锥曲线

Objective

Build the skills to answer exam questions on **conic sections**.

You must be able to:

- identify a **conic section** 圆锥曲线 (circle, ellipse, parabola, hyperbola) from its equation

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Conic sections

Curves formed by slicing a cone. Standard equations:

- **circle**: $x^2 + y^2 = r^2$;
- **ellipse**: $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$;
- **parabola**: $y = ax^2$;
- **hyperbola**: $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$.

■ Example

$\dfrac{x^2}{9} + \dfrac{y^2}{4} = 1$ is an ellipse (sum of squared terms = 1).

2 Practice

2.1 Name the four conic sections. [1]

2.2 State the standard equation of an ellipse. [1]

2.3 Identify the conic $\dfrac{x^2}{9} + \dfrac{y^2}{4} = 1$. [2]

3 Exam-style questions

3.1 The equation $\dfrac{x^2}{16} + \dfrac{y^2}{9} = 1$ is [1]

A B
C D

A a circle
B an ellipse
C a parabola
D a hyperbola

3.2 The equation $x^2 - y^2 = 1$ is [1]

A B
C D

A a circle
B an ellipse
C a hyperbola
D a line

3.3 Classify each conic.

(a) $x^2 + y^2 = 25$. [1]

(b) $y = x^2$. [1]

(c) $\dfrac{x^2}{4} - \dfrac{y^2}{9} = 1$. [1]