



QUESTION WORKBOOK

Conic sections

Further Pure 1 · Year FM

7 questions · 27 marks

PRINT EDITION

SECTION A · Warm-up

- A1** Write down parametric coordinates for a general point on the parabola $y^2 = 4ax$ and on the rectangular hyperbola $xy = c^2$. [2]

- A2** For the parabola $y^2 = 20x$, state a , the focus and the directrix. [3]

SECTION B · Standard

- B1** For the ellipse $x^2/16 + y^2/7 = 1$, find the eccentricity, the foci and the equations of the directrices. [4]

- B2** For the hyperbola $x^2/16 - y^2/9 = 1$, find the eccentricity and the foci, and state the difference of focal distances at the vertex $(4, 0)$. [4]

- B3** State the focus-directrix property of a conic, and explain how the eccentricity decides which of the three curves appears. [3]

- B4** The point $P(16, 16)$ lies on the parabola $y^2 = 16x$. Verify that it does, and check the focus-directrix property at P . [4]

SECTION C · Stretch

- C1** The parabola $y^2 = 16x$ has focus S and directrix d . The tangent at the point $P(16, 16)$ meets d at Q . Find the coordinates of Q and prove that angle PSQ is a right angle. [7]