

# Graph Sketching & Transformations

## Question Paper 1

Level	A Level
Subject	Maths
Exam Board	OCR
Topic	Coordinate Geometry & Graphs
Sub Topic	Graph Sketching & Transformations
Booklet	Question Paper 1

**Time Allowed:** 55 minutes

**Score:** /46

**Percentage:** /100

- 1 (i) Sketch the curve  $y = -\frac{1}{x}$ . [2]
- (ii) The curve  $y = -\frac{1}{x}$  is translated by 2 units parallel to the  $x$ -axis in the positive direction. State the equation of the transformed curve. [2]
- (iii) Describe a transformation that transforms the curve  $y = -\frac{1}{x}$  to the curve  $y = -\frac{1}{3x}$ . [2]
- 2 (i) Sketch the curve  $y = 2x^2 - x - 3$ , giving the coordinates of all points of intersection with the axes. [4]
- (ii) Hence, or otherwise, solve the inequality  $2x^2 - x - 3 > 0$ . [2]
- (iii) Given that the equation  $2x^2 - x - 3 = k$  has no real roots, find the set of possible values of the constant  $k$ . [3]
- 3 The curve  $y = f(x)$  passes through the point  $P$  with coordinates  $(2, 5)$ .
- (i) State the coordinates of the point corresponding to  $P$  on the curve  $y = f(x) + 2$ . [1]
- (ii) State the coordinates of the point corresponding to  $P$  on the curve  $y = f(2x)$ . [1]
- (iii) Describe the transformation that transforms the curve  $y = f(x)$  to the curve  $y = f(x + 4)$ . [2]
- 4 (i) Sketch the curve  $y = \frac{2}{x^2}$ . [2]
- (ii) The curve  $y = \frac{2}{x^2}$  is translated by 5 units in the negative  $x$ -direction. Find the equation of the curve after it has been translated. [2]
- (iii) Describe a transformation that transforms the curve  $y = \frac{2}{x^2}$  to the curve  $y = \frac{1}{x^2}$ . [2]
- 5 (i) Sketch the curve  $y = \sqrt{x}$ . [2]
- (ii) Describe the transformation that transforms the curve  $y = \sqrt{x}$  to the curve  $y = \sqrt{x - 4}$ . [2]
- (iii) The curve  $y = \sqrt{x}$  is stretched by a scale factor of 5 parallel to the  $x$ -axis. State the equation of the transformed curve. [2]

- 6 (i) Sketch the curve  $y = \frac{1}{x}$ . [2]
- (ii) Describe fully the single transformation that transforms the curve  $y = \frac{1}{x}$  to the curve  $y = \frac{1}{x} + 4$ . [2]
- 7 (i) Sketch the curve  $y = -\frac{1}{x^2}$ . [2]
- (ii) Sketch the curve  $y = 3 - \frac{1}{x^2}$ . [2]
- (iii) The curve  $y = -\frac{1}{x^2}$  is stretched parallel to the y-axis with scale factor 2. State the equation of the transformed curve. [1]
- 8 (i) Expand  $(x - 2)^2(x + 1)$ , simplifying your answer. [3]
- (ii) Sketch the curve  $y = (x - 2)^2(x + 1)$ , indicating the coordinates of all intercepts with the axes. [3]