Transformation Of Functions Exam Questions (From OCR 4721)

Q1 (Jan 2005, Q3)

(i) The curve $y = 5\sqrt{x}$ is transformed by a stretch, scale factor $\frac{1}{2}$, parallel to the x-axis. Find the equation of the curve after it has been transformed. [2]

(ii) Describe the single transformation which transforms the curve $y = 5\sqrt{x}$ to the curve $y = (5\sqrt{x}) - 3$. [2]

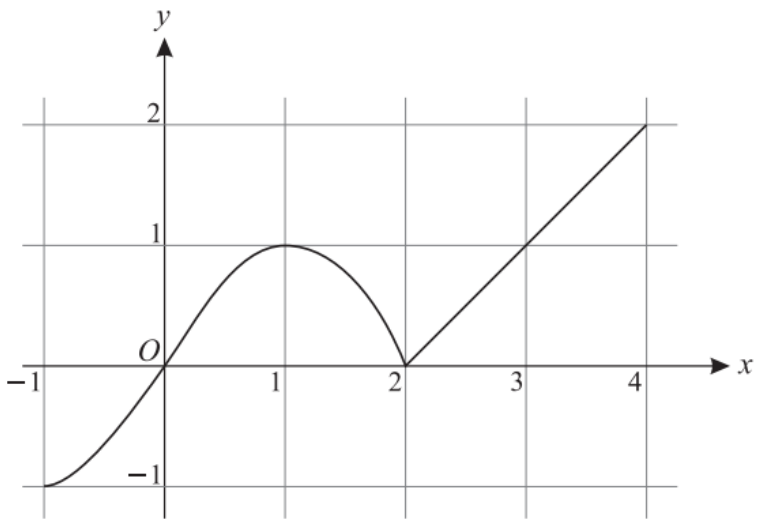
Q2 (Jun 2005, Q3)

(i) Sketch the curve $y = x^3$. [1]

(ii) Describe a transformation that transforms the curve $y = x^3$ to the curve $y = -x^3$. [2]

(iii) The curve $y = x^3$ is translated by p units, parallel to the x-axis. State the equation of the curve after it has been transformed. [2]

Q3 (Jan 2007, Q5)



The graph of $y = f(x)$ for $-1 \leqslant x \leqslant 4$ is shown above.

(i) Sketch the graph of $y = -f(x)$ for $-1 \leqslant x \leqslant 4$. [2]

(ii) The point $P(1, 1)$ on $y = f(x)$ is transformed to the point Q on $y = 3f(x)$. State the coordinates of Q. [2]

(iii) Describe the transformation which transforms the graph of $y = f(x)$ to the graph of $y = f(x + 2)$. [2]

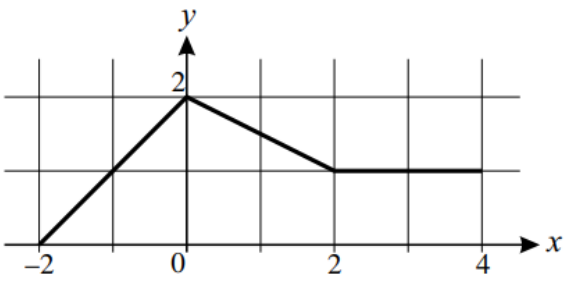
Q4 (Jun 2010, Q2)

(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]**

Q5 (Jan 2010, Q2)



The graph of $y = f(x)$ for $-2 \leqslant x \leqslant 4$ is shown above.

(i) Sketch the graph of $y = 2f(x)$ for $-2 \leqslant x \leqslant 4$ on the axes provided. **[2]**

(ii) Describe the transformation which transforms the graph of $y = f(x)$ to the graph of $y = f(x - 1)$. **[2]**

Q6 (Jan 2013, Q3)

(i) Sketch the curve $y = (1 + x)(2 - x)(3 + x)$, giving the coordinates of all points of intersection with the axes. **[3]**

(ii) Describe the transformation that transforms the curve $y = (1 + x)(2 - x)(3 + x)$ to the curve $y = (1 - x)(2 + x)(3 - x)$. **[2]**

Q7 (Jun 2013, Q5)

(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]**

Q8 (OCR 4722, Jun 2016, Q8) [Modified]

(i) The curve $y = 3^x$ can be transformed to the curve $y = 3^{x-2}$ by a translation. Give details of the translation. **[2]**

(ii) Alternatively, the curve $y = 3^x$ can be transformed to the curve $y = 3^{x-2}$ by a stretch. Give details of the stretch. **[2]**

(iii) Sketch the curve $y = 3^{x-2}$, stating the coordinates of any points of intersection with the axes. **[2]**
