IGCSE – Graphs/tangents/gradients -3

Oct 04 Paper 4

2 Answer the whole of this question on a sheet of graph paper.

(a) $f(x) = \dfrac{12}{x+1}$

x	0	1	2	3	4	5	6	7	8	9	10	11
f(x)	p	6	4	3	2.4	2	1.71	q	1.33	r	1.09	1

(i) Calculate the values of p, q and r. [3]

(ii) Draw the graph of $y = f(x)$ for $0 \leqslant x \leqslant 11$.
Use a scale of 1cm to 1 unit on each axis. [5]

(iii) By drawing a suitable line, find an estimate of the gradient of the graph at the point (3, 3). [3]

(b) On the same grid draw the graph of $y = 8 - x$ for $0 \leqslant x \leqslant 8$. [2]

(c) **(i)** Show that the equation $f(x) = 8 - x$ simplifies to $x^2 - 7x + 4 = 0$. [2]

(ii) **Use your graph** to solve this equation, giving your answers correct to 1 decimal place. [2]

May 05 Paper 4

4 Answer the whole of this question on a sheet of graph paper.

The table gives values of $f(x) = 2^x$, for $-2 \leqslant x \leqslant 4$.

x	-2	-1	0	1	2	3	4
f(x)	p	0.5	q	2	4	r	16

(a) Find the values of p, q and r. [3]

(b) Using a scale of 2 cm to 1 unit on the x-axis and 1 cm to 1 unit on the y-axis, draw the graph of $y = f(x)$ for $-2 \leqslant x \leqslant 4$. [5]

(c) Use your graph to solve the equation $2^x = 7$. [1]

(d) What value does f(x) approach as x decreases? [1]

(e) By drawing a tangent, estimate the gradient of the graph of $y = f(x)$ when $x = 1.5$. [3]

(f) On the same grid draw the graph of $y = 2x + 1$ for $0 \leqslant x \leqslant 4$. [2]

(g) Use your graph to find the non-integer solution of $2^x = 2x + 1$. [2]