

C.E.M.TUITION

Student Name : _____

Review Topic : Real Functions

(Preliminary Course - Paper 1)

Year 11 - 2 Unit

1996

Question 1

- (a) Illustrate on the real number line the set of x such that : $|x - 1| + |x + 1| > 2$
- (b) State the natural (i.e. the largest possible) domain of the function given by :

$$y = \sqrt{1+x} - \sqrt{1-x} .$$

(a) $x < -1$ or $x > 1$ (b) $-1 \leq x \leq 1$

Question 2

(a) A function is defined by the rule :

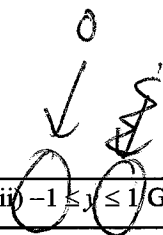
$$f(x) = \begin{cases} 0 & \text{if } x \leq -2 \\ -1 & \text{if } -2 < x < 0 \\ x & \text{if } x \geq 0 \end{cases}$$

Find (i) $f(-2) + f(-1) + f(0)$ (ii) $f(a^2)$

(b) State (i) the natural (largest possible) domain; and (ii) the range of the function for which

$f(x) = \sqrt{1-x^2}$ and sketch the graph.

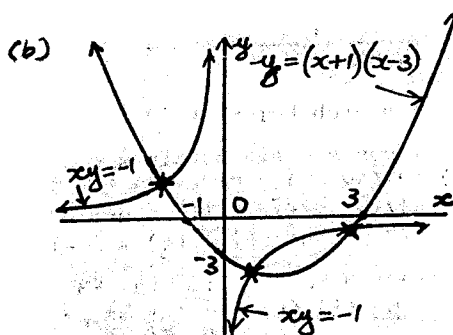
(a) (i) -1 (i) a^2 (b) (i) $-1 \leq x \leq 1$ (ii) $-1 \leq y \leq 1$ Graph of a semi-circle.



Question 3

(a) If $f(x) = ax^2 + bx + c$ find the value of $f(x) - f(-x)$.

(b) Sketch, using the same axes, but not on graph paper,
 $y = x^2 - 2x + 3$ and $xy = -1$



(a) $2bx$

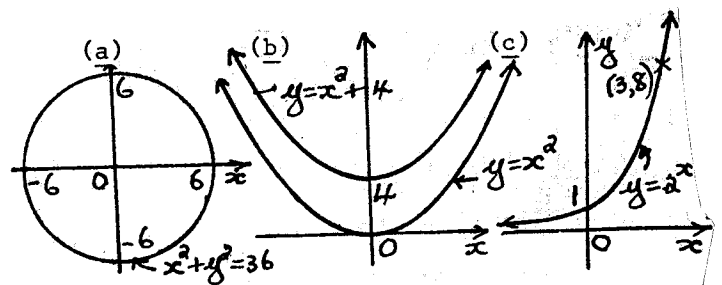
Question 4

Draw separate sketches (showing the main features - not on graph paper) of :

(a) $x^2 + y^2 = 36$

(b) $y = x^2 + 4$

(c) $y = 2^x$



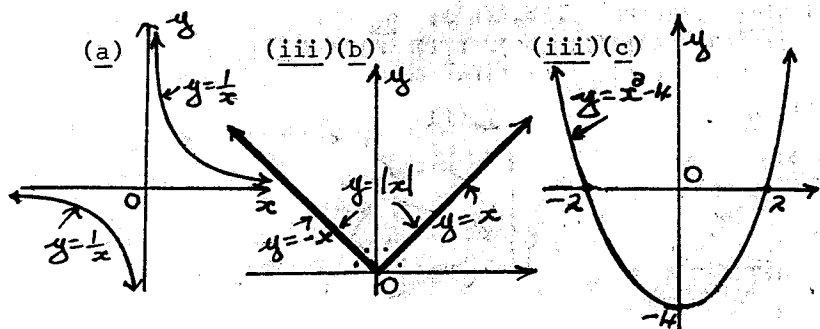
Question 5

Draw separate sketches (showing the main features - not on graph paper) of :

(a) $xy = 1$

(b) $y = |x|$

(c) $y = x^2 - 4$



Question 6

The parabola $y = ax^2 - b$ and the circle $x^2 + y^2 = 16$ meet on both the x and y axes.
If a and c are both positive, what are their values ?

$$a = \frac{1}{4}, b = 4$$
