3 UNIT TEST -- GRAPHS & FUNCTIONS

Question (1)

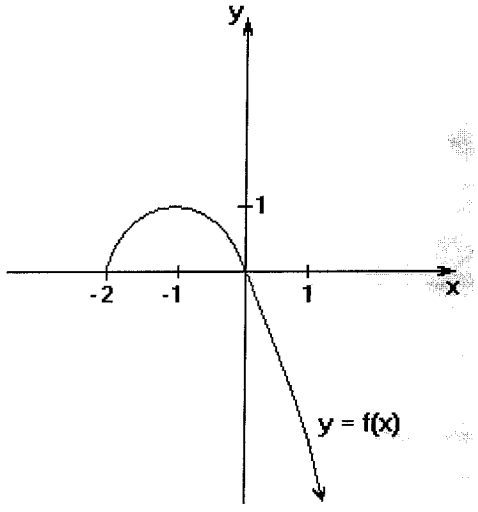
(a) Give the Domain and Range of the relations which follow:-

(i) $y = \dfrac{1}{\sqrt{4-x}}$

$\mathcal{D}$ =

$\mathcal{R}$ =

(ii)

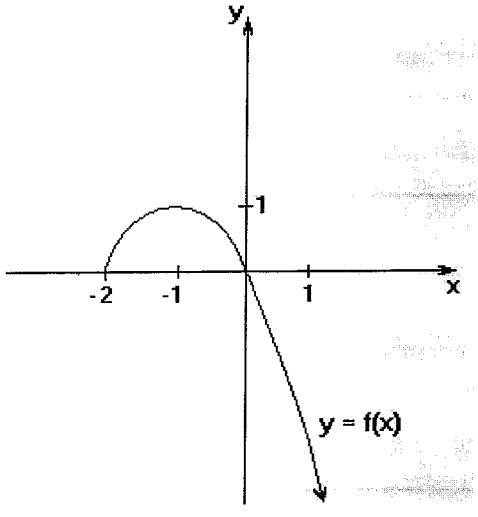


$\mathcal{D}$ =

$\mathcal{R}$ =

(b) On the diagram in (a) part (ii) draw the inverse of $y = f(x)$

(c) On the diagram below draw a sketch of the function $y = 1 - f(x)$



(d) For the function $y = x^2 - 2x$

(i) Find $f(-x)$ expressed in its simplest form.

(ii) Find $f(x+2)$ expressed in its simplest form.

(iii) Is the function $y = x^2 - 2x$ Odd , Even or Neither.
Give reasons for your answer.

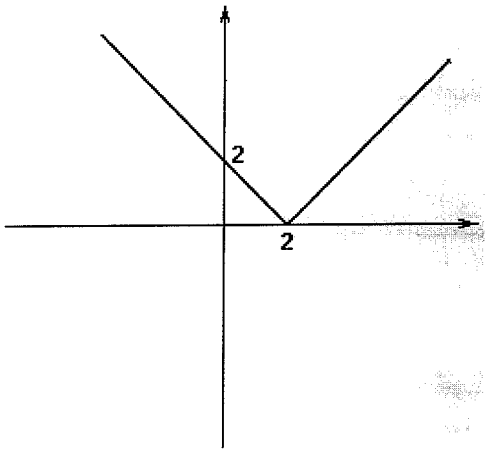
Question (2)

(a) Find the inverse function $f^{-1}(x)$ of:-

$$f(x) = \sqrt{2x+5}$$

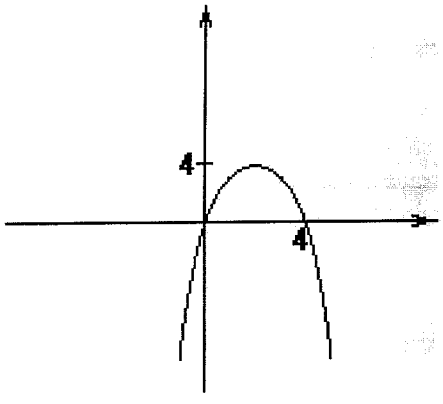
(b) What is the equation of the graphs shown below?

(i)



The equation is :

(ii)

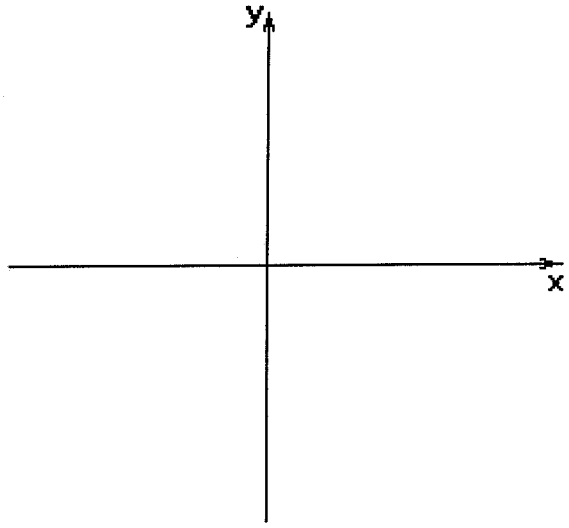


The equation is:

(c) For the function described below: -

$$f(x) = \begin{cases} 1 & for\ x<0 \\ 4^x & for\ 0\le x\le 1 \\ \sqrt{x-1} & for\ x>1 \end{cases}$$

(i) Sketch the graph of this function.

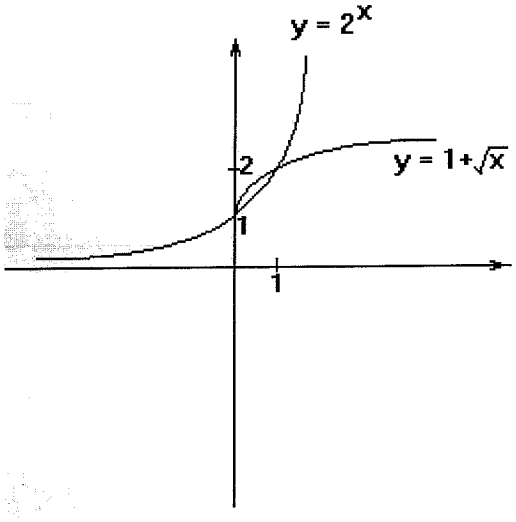


(ii) For this same function evaluate :

$$f(5)-3f(1)+f(-3)$$

(d) Use the graphs of the two functions shown below to solve the equation :

$$2^x < 1+\sqrt{x}$$

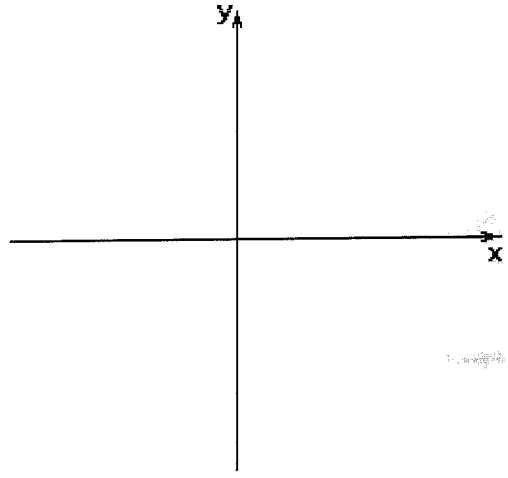


Answer:

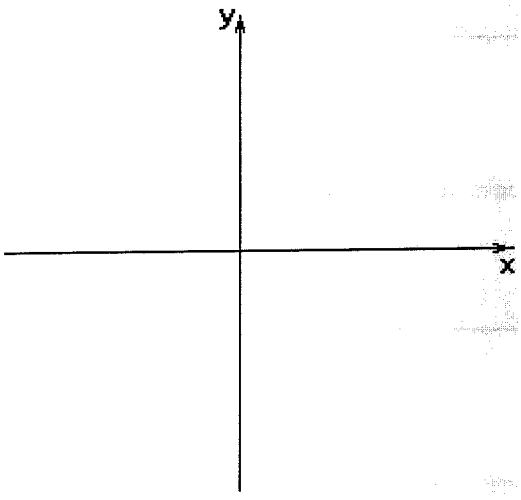
Question (3)

Sketch the graphs of the following equations on the number planes provided.
Do any working out required in the right hand column.

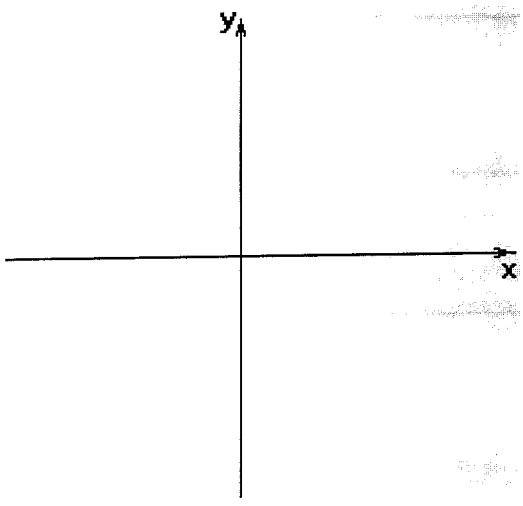
(a) $y = \frac{1}{x+1} - 2$



(b) $y = 4x - x^3$

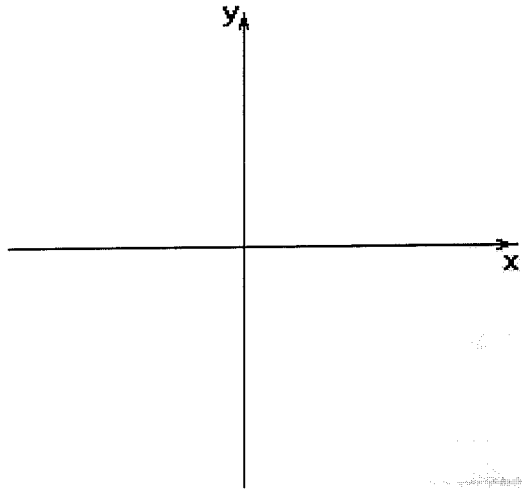


(c) $y = \frac{1}{2^x}$

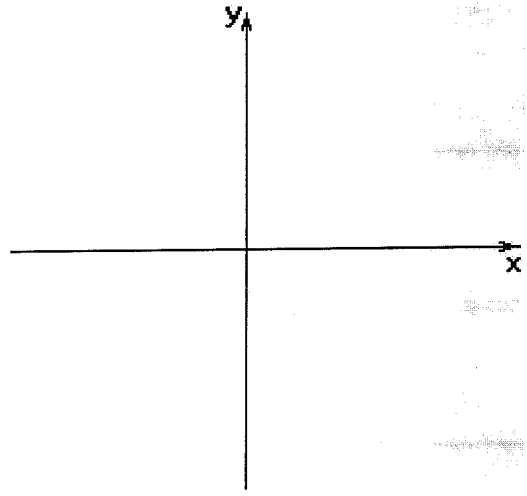


Question (3) - continued

(d) $y = x^4 - 4x^3 - 5x^2$

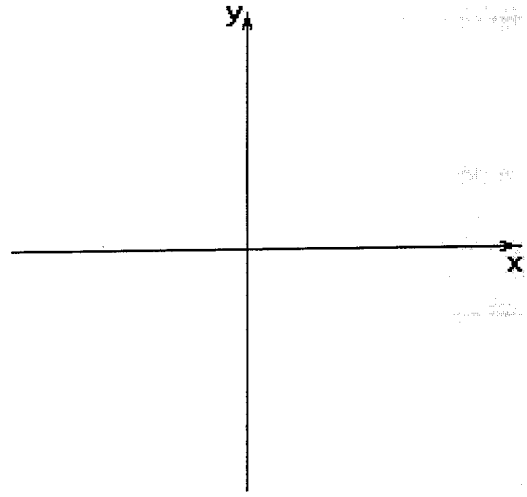


(e) $y = x^2 + y^2 + 6x = 0$



(f) Shade the region represented by

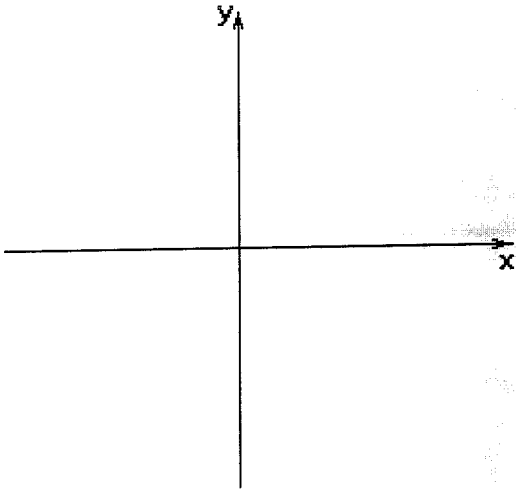
$y < \sqrt{4-x}$



Question (4)

(a) Sketch the graph of:

$$y = \frac{x+1}{x^2-1}$$



(b) Solve the inequality $|x| \leq \frac{x}{x-1}$