EMMANUEL CATHOLIC COLLEGE
FUNCTIONS REVISION

NAME _____

Question 1: WATP 2007 Q20

20.   [12 marks]

Consider the three functions $f(x) = \dfrac{x+1}{x-1}$, $g(x) = \left| \dfrac{x+1}{x-1} \right|$, $h(x) = \dfrac{|x|+1}{|x|-1}$.
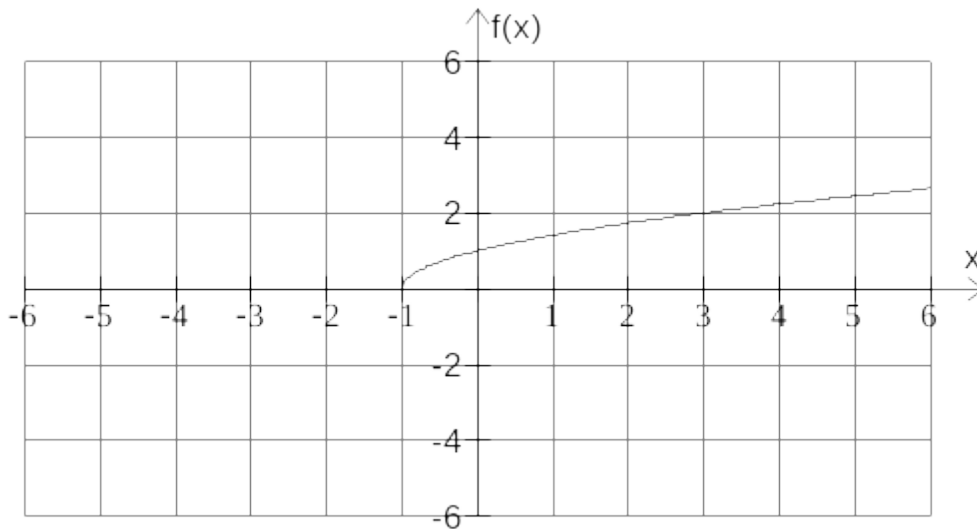
Write down the domain and range for each of the following,

	Domain	Range
$f(x)$		
$f^{-1}(x)$		
$g(x)$		
$h(x)$		
$f(f(x))$		

Question 2: EDWEST 2006 Q4(a)

(a)　　Given that $f(x)=2^x$ find $h(x)$ so that $f(h(x))=2-x^2$.　　　　[3]

Question 3: EDWEST 2004 Q1(a)

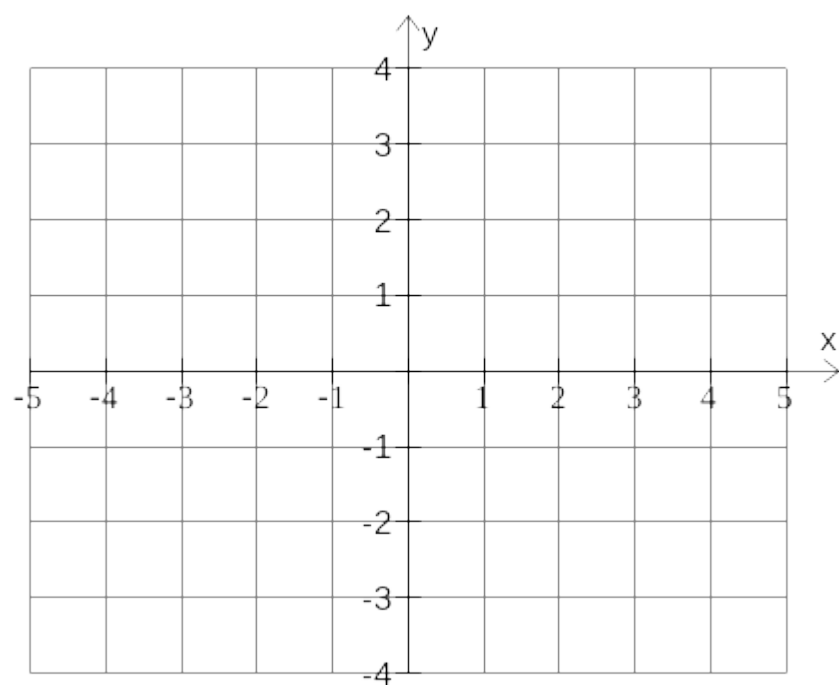(a) The diagram shows the graph of $f(x)$. On the same axes carefully draw $f^{-1}(x)$.   [3]

Question 4: EDWEST 2004 Q2

2.   [7 marks]

Two functions are defined by $f(x)=\dfrac{x(x-3)}{2}$ and $g(x)=3-|x|$.

(a)   On the same axes, sketch the functions f and g.   [3]

(b)   Find the area bounded by the graphs of *f* and *g*.   [4]

Question 1: WATP 2007 Q20

[12 marks]

	Domain	Range	
$f(x)$	$x \neq 1$ ✓	$y \neq 1$	✓
$f^{-1}(x)$	$x \neq 1$ ✓	$y \neq 1$	✓
$g(x)$	$x \neq 1$ ✓ ✓✓	$y \geq 0$	
$h(x)$	$x \neq \pm 1$ ✓	$y \leq -1$ and $y > 1$	✓✓
$f(f(x))$	$x \neq 1$ ✓	$y \neq 1$	✓

Question 2: EDWEST 2006 Q4(a)

(a)   Given that $f(x) = 2^x$ find $h(x)$ so that $f(h(x)) = 2 - x^2$.   [3]

$$2^{h(x)} = 2 - x^2$$

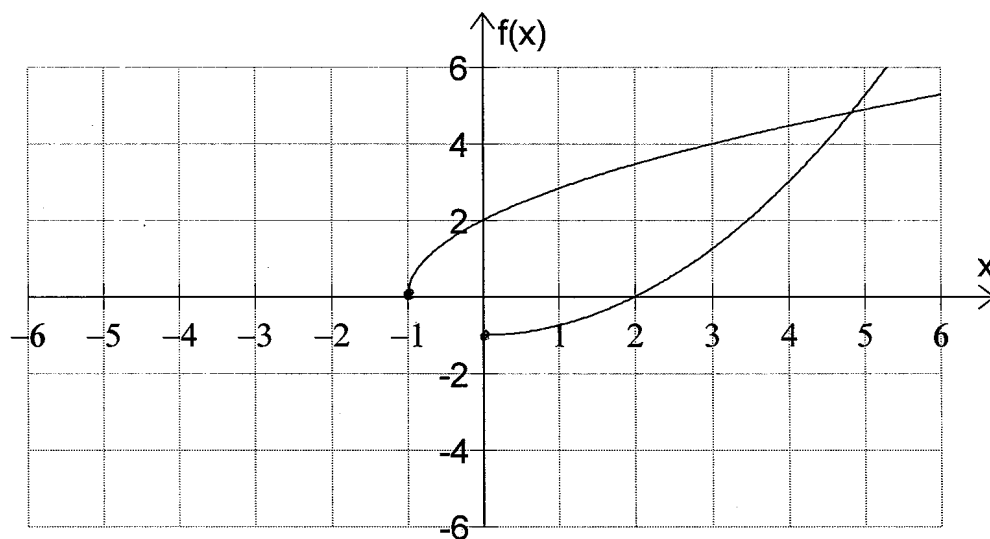$$h(x) \log 2 = \log(2 - x^2) \qquad x^2 < 2$$

ALSO
$h(x) = \log_2(2 - x^2)$

$$h(x) = \frac{\log(2 - x^2)}{\log 2} \qquad |x| < \sqrt{2}$$

Question 3: EDWEST 2004 Q1(a)

(a) The diagram shows the graph of $f(x)$. On the same axes carefully draw $f^{-1}(x)$.   [3]
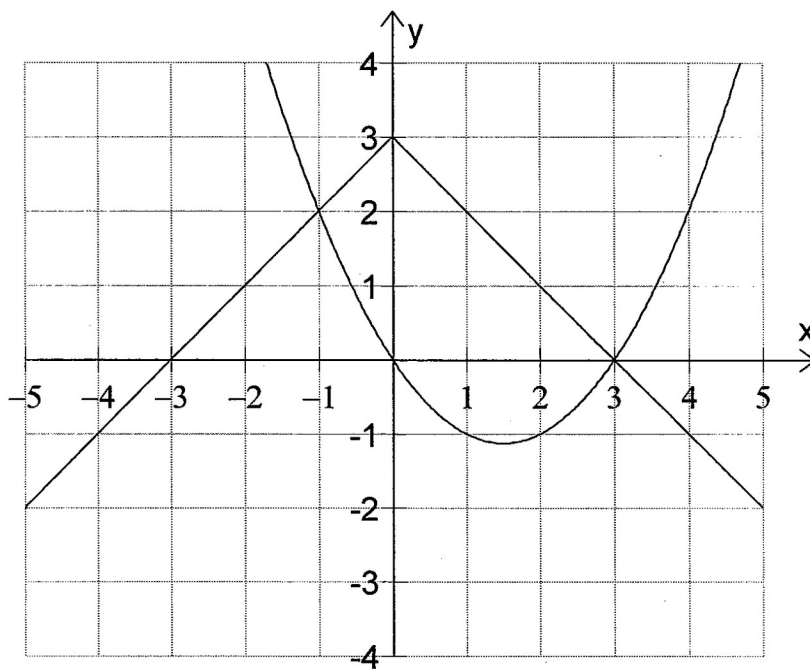
Question 4: EDWEST 2004 Q2

2.   [7 marks]

Two functions are defined by $f(x) = \dfrac{x(x-3)}{2}$ and $g(x) = 3 - |x|$.

(a)   On the same axes, sketch the functions f and g.   [3]

(b)   Find the area bounded by the graphs of f and g.   [4]

$$\int_{-1}^{3} \left| 3 - |x| - \frac{x(x-3)}{2} \right| \, dx = 8\tfrac{1}{3}$$