IB Standard Level Year 1 Unit 2 Exam 3

Name: _____ Date: _____ Period: _____
Show all work neatly and clearly in order to receive full credit. SL packet and Calculator allowed. No notes.

1. Graph the function using transformations on the coordinate plane below.

(i) Label at least 5 points (5 points). $f(x) = -(x+3)^2 + 4$

(ii) The vertex is _____ (1 point)

(iii) The x-intercepts are _____ (1 point)

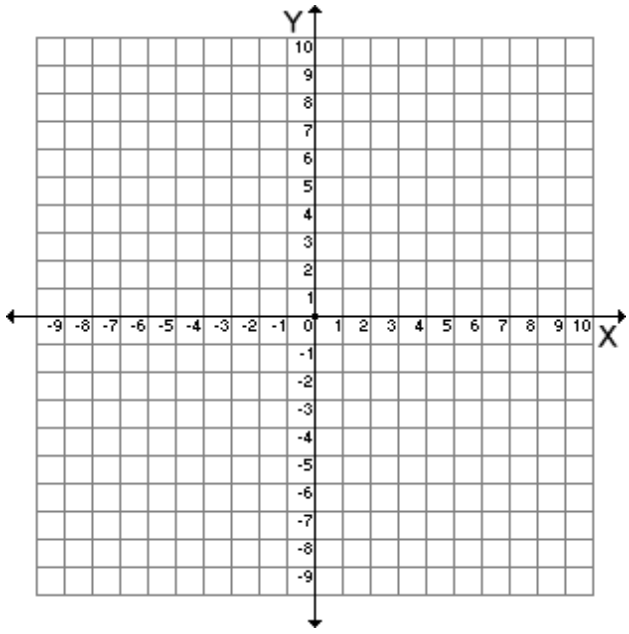
(iv) The y-intercept is _____ (1 point)

(v) Give the interval(s) in which the function is increasing _____ (1 point)

(vi) Give the interval(s) in which the function is decreasing _____ (1 point)

(vii) What is the Domain (1 point)?

(viii) What is the Range (1 point)?



(ix) Does the function have a relative minimum/maximum (1 point)? What is it (1 point)?

(x) What is $f(0)$ (1 point)?

(xi) Find $f(x+5)$ and simplify (2 points).

2. Graph the function using transformations on the coordinate plane below.

(i) Label at least 5 points (5 points). $f(x) = 2|x| - 6$

(ii) The vertex is _____ (1 point)

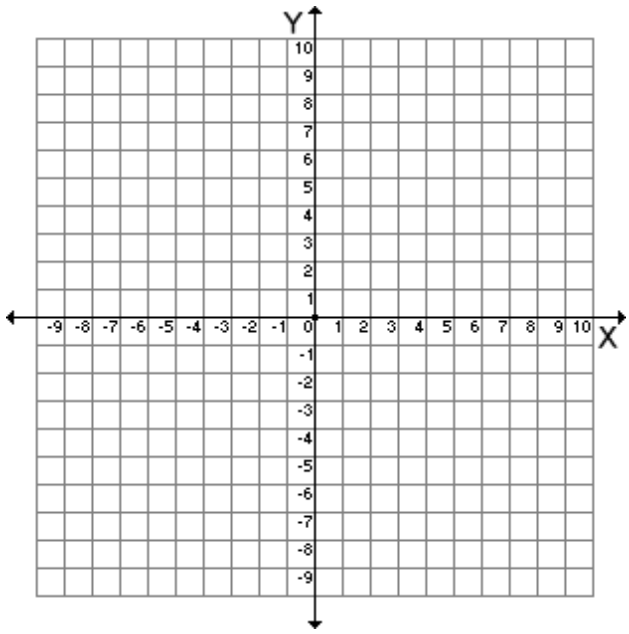
(iii) The x-intercepts are _____ (1 point)

(iv) The y-intercept is _____ (1 point)

(v) Give the interval(s) in which the function is increasing _____ (1 point)

(vi) Give the interval(s) in which the function is decreasing _____ (1 point)

(vii) State if the function is even/odd/neither and show your work algebraically (3 points)



(viii) What is the value of *f*(9) (1 point)?

3. The two coordinates are given: (5, -1) and (-5, 5)

(i) Find the slope intercept form of the equation of the line that passes through the two points (4 points).

(ii) The slope is _____ (1 point). (iii) The *y*-intercept is _____ (1 point).

4. Evaluate the function at each specified value of the independent variable and simplify. (2 points each)

$$f(x)=\begin{cases}2-x^2, & x>0\\ 2x+5, & x\le 0\end{cases}$$

(i) $f(-4)$ (ii) $f(0)$ (iii) $f(10)$

5. Given $f(x)=x^2+5$ and $g(x)=\sqrt{1-x}$ (2 points each). Find each.

(i) $(f+g)(x)$ (ii) $(f-g)(x)$ (iii) $(fg)(x)$ (iv) $(f/g)(x)$

(v) Determine the domain of f (vi) Determine the Domain of g

(vii) $(f\circ g)$ (viii) $(g\circ f)$

6. Show that f and g are inverse functions algebraically (5 points). $f(x)=x^3+5$, $g(x)=\sqrt[3]{x-5}$