Name: _____ Date: _____

UNIT #7 – TRANSFORMATIONS OF FUNCTIONS
COMMON CORE ALGEBRA II

Part I Questions

1. The quadratic function $f(x)$ has a turning point at $(5,-8)$. If $g(x)=f(x+7)-3$, then at which of the following does $g(x)$ have a turning point?

   (1) $(-2,-11)$ (3) $(-7,-3)$

   (2) $(12,-11)$ (4) $(12,-5)$

   _____

2. Where does the absolute value function $y=\frac{1}{2}|x-8|+3$ have a turning point?

   (1) $(-4,3)$ (3) $(8,3)$

   (2) $(4,-3)$ (4) $(8,-3)$

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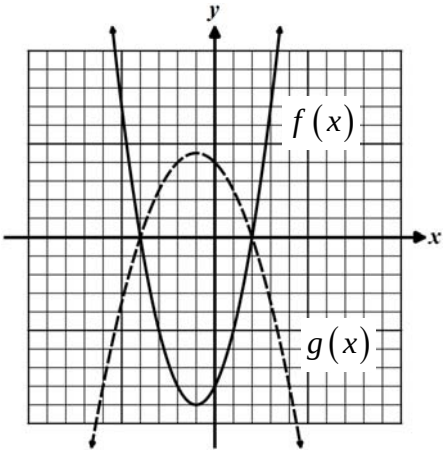
3. The function $f(x)$ is shown below graphed in solid while the function $g(x)$ is shown dashed. Which of the following equations describes the relationship between the two functions?

   (1) $g(x)=f(x)-6$

   (2) $g(x)=-\frac{1}{2}f(x)$

   (3) $g(x)=2f(x)$

   (4) $g(x)=f\left(\frac{1}{2}x\right)$



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4. Given that the function $y=x^2+6x-27$ has x-intercepts at $x=-9$ and $x=3$, where does the function $y=(3x)^2+6(3x)-27$ have x-intercepts?

   (1) $x=\pm 6$ (3) $x=-27$ and $x=9$

   (2) $x=-12$ and $x=0$ (4) $x=-3$ and $x=1$

   _____

5. If the point $(-3, 7)$ lies on the graph of $f(x)$, then which of the following points must lie on the graph of $y = 5f(x) - 20$?

(1) $(-15, -13)$ (3) $(2, -13)$

(2) $(-3, 15)$ (4) $(1, 25)$

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6. The range of the function $f(x)$ is $-4 \le y \le 10$. If $g(x) = -f(x) + 3$ then which of the following is the range for $g(x)$?

(1) $-7 \le y \le 7$ (3) $-13 \le y \le 1$

(2) $5 \le y \le 15$ (4) $-3 \le y \le 8$

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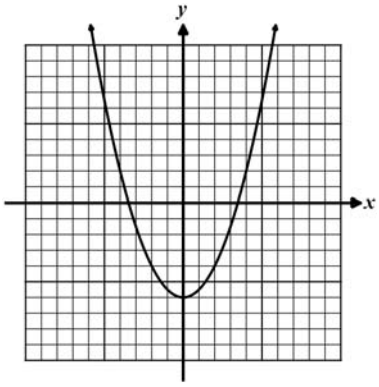
7. Which graph below shows an even function?

(1)



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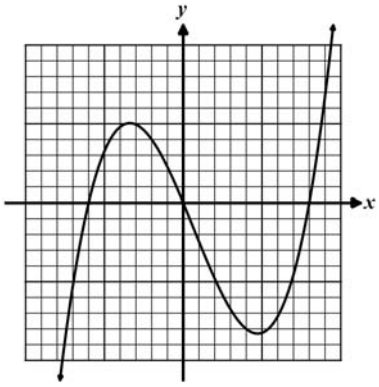

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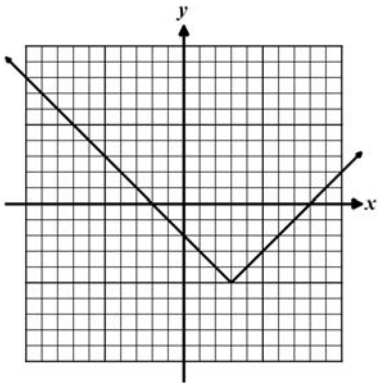

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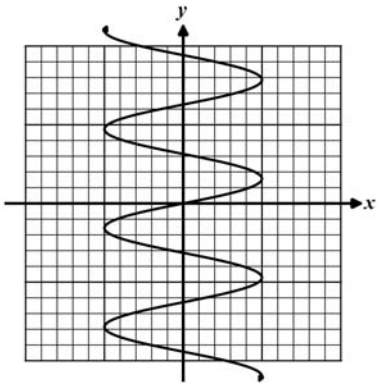

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8. If $f(x)$ is an odd, one-to-one function with $f(5) = -2$ then which point *must* lie on the graph of its inverse, $f^{-1}(x)$?

(1) $(5, -2)$ (3) $(-5, 2)$

(2) $(2, -5)$ (4) $(2, 5)$

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Free Response

9. For the function $f(x)$ it is known that $(-12, 4)$ lies on the function. A second function, $g(x)$, is defined by the formula $g(x) = f(2x) - 3$.

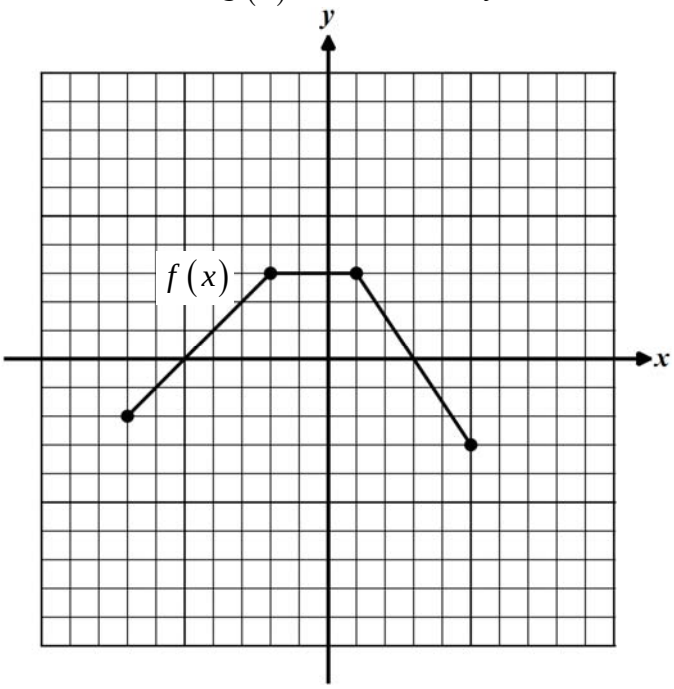
   Describe the transformations that occur to the graph of f in order to produce the graph of g.

   Based on the fact that the point $(-12, 4)$ lies on $f(x)$, what point must lie on $g(x)$?

10. The graph of the function $f(x)$ is shown below. The function $g(x)$ is defined by the formula $g(x) = -2f(x)$ for all values of x.

    Produce the graph of g on the same grid.

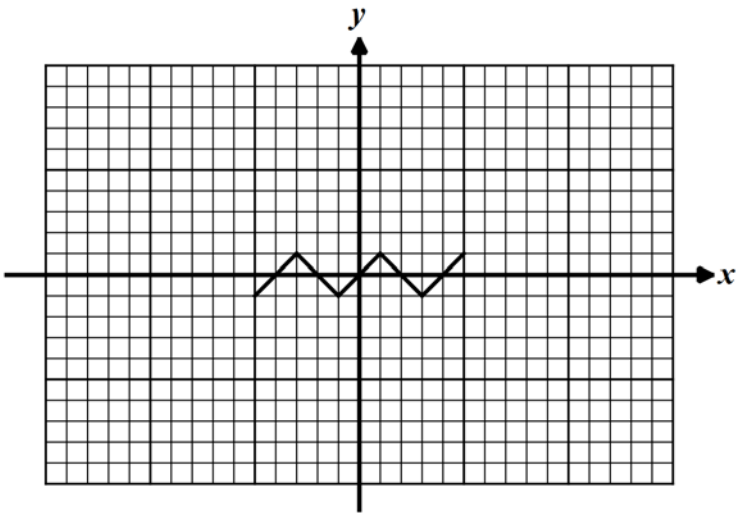
    Solve the equation $f(x) = g(x)$ for all values of x.



11. The function $f(x) = \dfrac{x^4 - 8}{4x}$ is either an even function or an odd function. Provide evidence to support your answer.

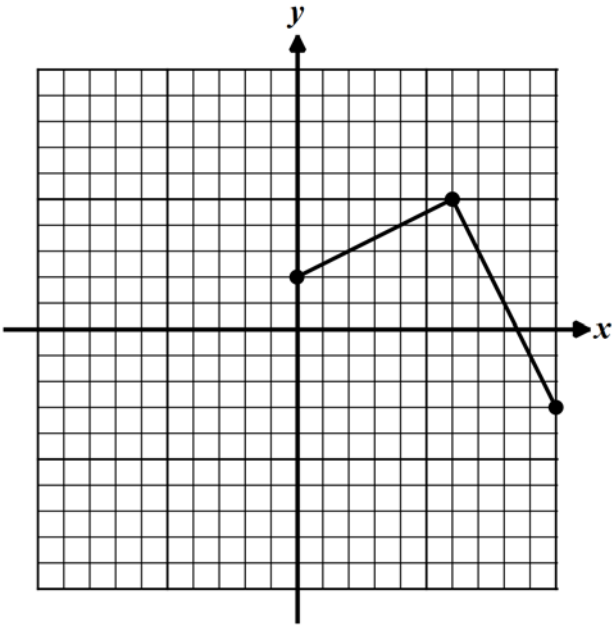
12. The graph of $f(x)$ is shown below. The function $g(x)$ is defined by $g(x)=5f\left(\frac{x}{2}\right)$.

Explain the transformations that will transform the graph of $f(x)$ into the graph of $g(x)$ and then produce it on the same grid.



13. The function below shows the portion of the even function $f(x)$ for $x \geq 0$.

Sketch the portion of $f(x)$ for $x<0$.



What value(s) of x solve the equation $f(x)=1$?

Calculate the average rate of change of the function over the interval $-10 \leq x \leq 4$. Show your work.

Does this function have an inverse that is also a function? Why or why not?

14. Given the parabola $f(x) = -(x-8)^2 + 5$, describe three transformations which would transform the graph of $y = x^2$ into the graph of $f(x)$. Give both the transformations and the order.

15. Describe the difference between the transformations $f(-x)$ and $-f(x)$ on the graph of $f(x)$.

16. A function $g(x)$ has a domain of $-5 \le x \le 10$ and a range of $y \le 15$. If a new function is defined by $y = 5g(-x) + 3$, then what are its domain and range? Explain how you found your answer.