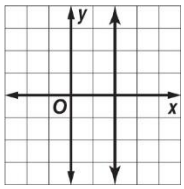
Pre – Calculus
REVIEW: Unit A

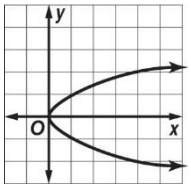
Name: _____

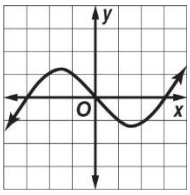
Part One: Calculator Use Allowed

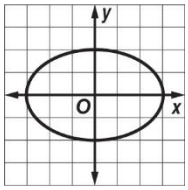
For numbers 1 – 4, circle the letter for the correct answer.

1. Which relation is a function? Circle all that apply.

a) 

b) 

c) 

d) 

2. Which function has a removable discontinuity?

a) $f(x) = \frac{x}{x+3}$ b) $f(x) = \frac{x^2-4}{x+2}$ c) $f(x) = \frac{1}{x+3}$ d) $f(x) = x^3 - 3$

3. Which of the following results in the graph of $f(x) = x^2$ being expanded vertically and reflected over the x–axis?

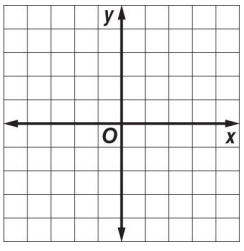
a) $f(x) = \frac{1}{3}x^2$ b) $f(x) = -3x^2$ c) $f(x) = -\frac{1}{x^2} + 3$ d) $f(x) = -\frac{1}{3}x^2$

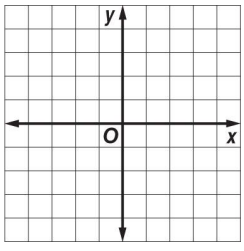
4. Which function has an inverse that is also a function?

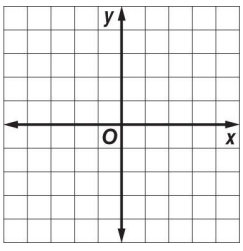
a) $f(x) = |x|$ b) $f(x) = x^2$ c) $f(x) = \frac{x+1}{x^2}$ d) $f(x) = x^3$

5. Given the parent function $p(x) = x^3$, what transformation occurs in the graph of $p(x) = (-3x - 7)^3$?

6. Create a graph that represents each type of discontinuity on the graphs below. Your graphs do not have to be based on a specific equation, rough sketches are fine.







7. Given $f(x) = x^2 - 2x$, find $f(4 - x)$.

8. Given the function $g(x) = 3x^3 - 2x$:

a. Describe the intervals on which the function is increasing and/or decreasing.

b. Describe the end behavior of the function.

9. What is $f(-2)$ for $f(x) = \begin{cases} |4x| & \text{if } x < -2 \\ x^3 - 1 & \text{if } x \geq -2 \end{cases}$?

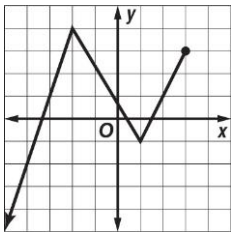
10. Given the function $f(x) = -x^3 + 2x$, state: where the function is increasing/decreasing, relative maximum(s) and relative minimum(s), absolute extrema(s) and the end behavior.

11. If $f(x) = x - 3$ and $g(x) = 2x - 4$, find $(f + g)(x)$ and state its domain.

12. Describe the transformations relating the graph of $g(x) = \frac{1}{4}(x-1)^2$ to the graph of its parent function $f(x) = x^2$.

Part Two: No Calculator Allowed

13. State the domain and range of the function shown. Use interval notation.



14. If $f(x) = x + 4$ and $g(x) = \frac{1}{x^2 - 16}$, find $(f \cdot g)(x)$ and its domain and $(\frac{f}{g})(x)$ and its domain.

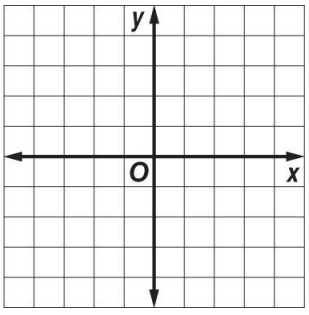
15. If $f(x) = x + 4$ and $g(x) \frac{1}{x^2 - 16}$, find $g\big(f(x)\big)$.

16. Find the inverse of $f(x) = x^3 - 6$ and state its domain.

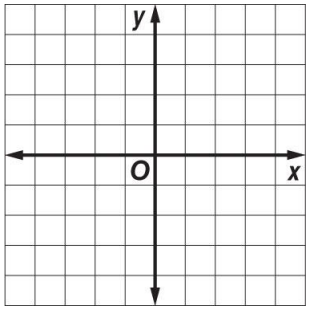
17. Given $f(x) = 5x^2 + 2$ and $g(x) = -x + 7$, find $f\big(g(-3)\big)$.

Graph each function. Remember not to utilize your graphing calculator ☺.

18. $p(x) = (x + 2)^3 - 1$



19. $g(x) = -\frac{1}{2}|x + 2| - 1$



20. $r(x) = 2\sqrt{x - 4} + 2$