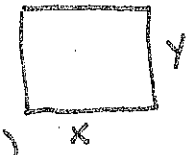
Quiz 1.1-1.4 Quiz Review

Use all three algebraic tests to check for symmetry.

1. $x^2 - y = 0$ y-axis
2. $y = x^3$ origin
3. $xy^2 + 10 = 0$ x-axis

4. A soccer playing field of length x and width y has a perimeter of 360 meters.



   a. Draw a picture that represents the problem.
   b. Write an equation to represent the area of the rectangle. $A = x(180 - x)$
   c. Use your equation and a graph to estimate the dimensions that yield the maximum area. 90 x 90

5. Determine whether the equation is a function.
   a. $x^2 + y^2 = 16$ no
   b. $y = \sqrt{x+5}$ yes
   c. $x - 1 = 0$ no

6. Evaluate $g(t) = 4t^2 - 3t + 5$ at: $g(2)$ *and* $g(t-2)$ $g(2) = 15$, $g(t-2) = 4t^2 - 19t + 27$

7. Use the following function to evaluate at: $f(-2), f(1),$ *and* $f(2)$.

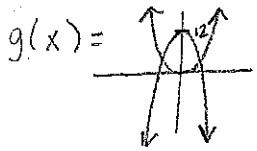
$$f(x) = \begin{cases} x^2 + 2, x \le 1 \\ 2x^2 + 2, x > 1 \end{cases}$$ $f(-2) = 6$, $f(1) = 3$, $f(2) = 10$

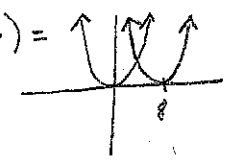
Find the domains.

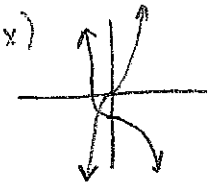
8. $f(x) = 5x^2 + 2x - 1$ $(-\infty, \infty)$
9. $s(t) = \frac{3t}{t+5}$ $(-\infty, -5) \cup (-5, \infty)$
10. $g(y) = \sqrt{y - 10}$ $[10, \infty)$
11. Are the following functions even, odd, or neither?
   a. $g(x) = x^3 - x$ odd
   b. $h(x) = x^2 + 1$ even
   c. $f(x) = 3x - 2$ neither

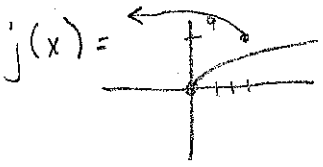
12. For each function, state and sketch the parent function, then sketch the graph (on the same axis).

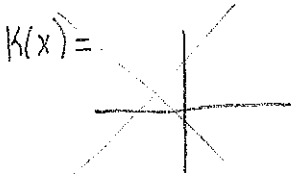
$g(x) = 12 - x^2$
$f(x) = (x-8)^2$
$h(x) = -x^3 - 1$
$j(x) = \sqrt{3 - x} + 9$
$k(x) = \frac{1}{2|x-2|} - 3$
$l(x) = -2\sqrt{x-1}$

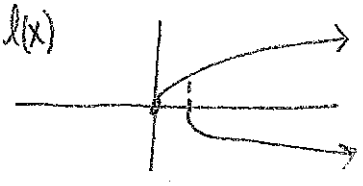












13. Find $(f-g)(x)$ and $(\frac{f}{g})(x)$. Then find the domain.

a. $f(x)=3x+1$ $g(x)=5x-4$ $-2x+5$, $(-\infty,\infty)$ / $\frac{3x+1}{5x-4}$, $(-\infty,\frac{4}{5})\cup(\frac{4}{5},\infty)$

b. $f(x)=x^2+6$ $g(x)=\sqrt{1-x}$ $x^2+6-\sqrt{1-x}$, $(-\infty,1]$ / $\frac{x^2+6}{\sqrt{1-x}}$, $(-\infty,1)$

14. Find $f\circ g(x), g\circ f(x)$, and the domain.

a. $f(x)=\sqrt{x+4}$ $g(x)=x^2$

b. $f(x)=\frac{1}{x}$ $g(x)=x+3$

c. $f(x)=\frac{3}{x^2-1}$ $g(x)=x+1$

a. $\sqrt{x^2+4}$, $(-\infty,\infty)$; $x+4$, $[-4,\infty)$

b. $\frac{1}{x+3}$, $(-\infty,-3)\cup(-3,\infty)$; $\frac{1}{x}+3$, $(-\infty,0)\cup(0,\infty)$

c. $\frac{3}{(x+1)^2-1}$, $(-\infty,-2)\cup(-2,0)\cup(0,\infty)$; $\frac{3}{x^2-1}+1$, $(-\infty,-1)\cup(-1,1)\cup(1,\infty)$

15. Find two functions, f and g, such that $(f\circ g)(x)=h(x)$

a. $h(x)=(2x+1)^2$ $g(x)=2x+1$, $f(x)=x^2$

b. $h(x)=\sqrt[3]{x^2-4}$ $g(x)=x^2-4$, $f(x)=\sqrt[3]{x}$

For the following functions, find the domain, and any holes or vertical asymptotes.

16. $f(x)=\frac{x-3}{x^2+x-12}$ $(-\infty,-4)\cup(-4,3)\cup(3,\infty)$, $x=3$ hole, $x=-4$ V.A.

17. $f(x)=\frac{x+1}{x^2-2x-3}$ $(-\infty,-1)\cup(-1,3)\cup(3,\infty)$, $x=-1$ hole, $x=3$ V.A.

18. $f(x)=\frac{x}{x^2+4}$ $(-\infty,\infty)$, no holes, no V.A.