Practice Test 1   Name_____

NOTE: You must show enough of your work so that the grader can follow what you did. If it is possible to find an exact answer by taking an algebraic approach, you will not receive full credit for an approximation. Calculators are not permitted.

1. Find the domain of the following function using interval notation:

a) $f(x) = \sqrt{4 - 3x}$

b) $y = \dfrac{9}{x - 6}$

c) $f(x) = \dfrac{2x + 1}{\sqrt{5 - x}}$

d) $y = \dfrac{x^2 - 9x}{x^2 - 81}$

2. Find the average rate of change of $f(x) = 2x^2 - 9$ on the interval $[4, b]$ and simplify.

3. Find the average rate of change of $f(x) = \dfrac{1}{t+4}$ on the interval $[9, 9+h]$ and simplify.

4. Find the difference quotient $\dfrac{f(x+h) - f(x)}{h}$, $h \neq 0$ for $f(x) = 5 - x^2$ and simplify.

5. Find the difference quotient $\dfrac{f(x+h) - f(x)}{h}$, $h \neq 0$ for $f(x) = 2x^2 - 3x$ and simplify.

6. For the functions $f(x) = \dfrac{1}{x-4}$ and $g(x) = \dfrac{2}{x} + 4$, find:
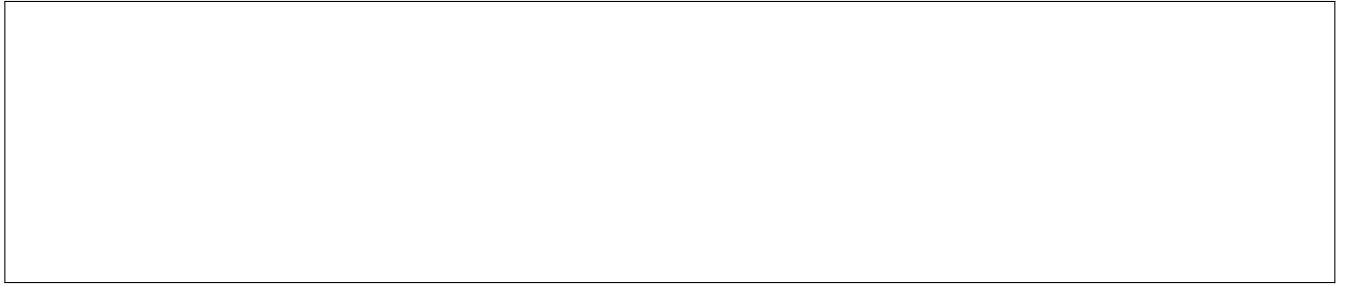
a) $(f \circ g)(x)$

b) $g(f(x))$

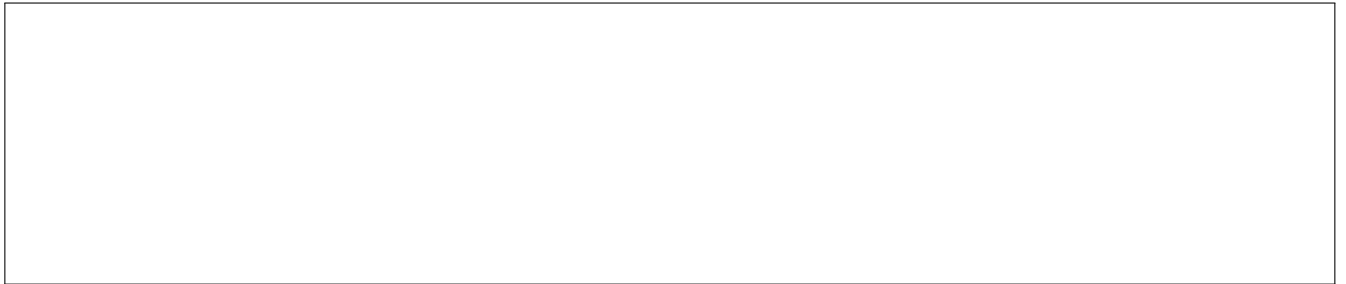7. For the functions $h(x) = \dfrac{4}{(x+2)^2}$ find $f(x)$ and $g(x)$ so that $h(x) = f(g(x))$.

8. For the functions $h(x) = \sqrt{\dfrac{2x-1}{3x+4}}$ find $f(x)$ and $g(x)$ so that $h(x) = f(g(x))$.

9. Describe how the graph of each given function is a transformation of the graph of the original function $f(x)$.
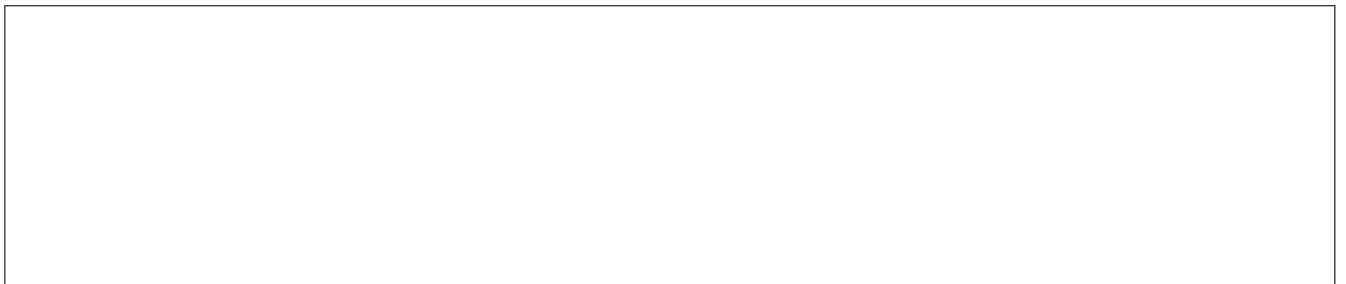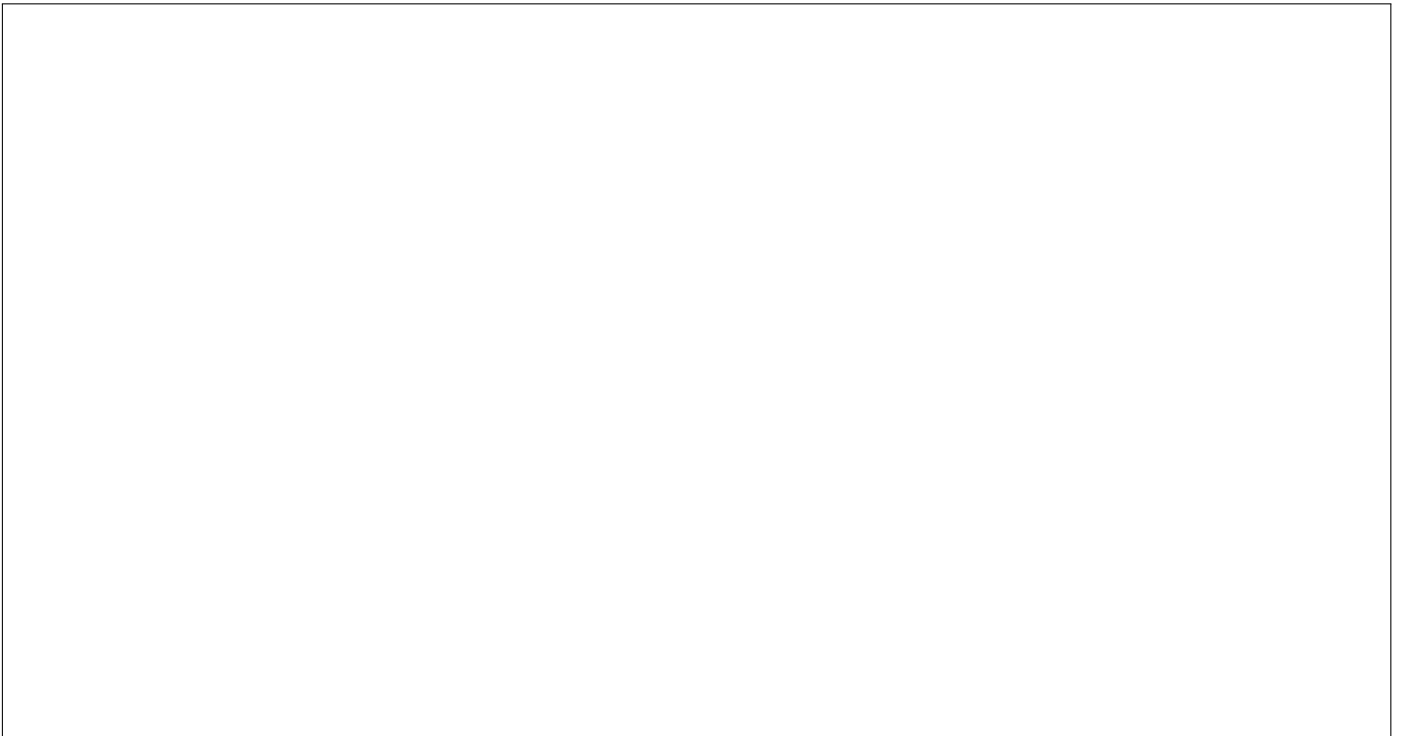
a) $f(-x)$

b) $f(x) + 5$

c) $f(x + 3)$

d) $4f(x)$

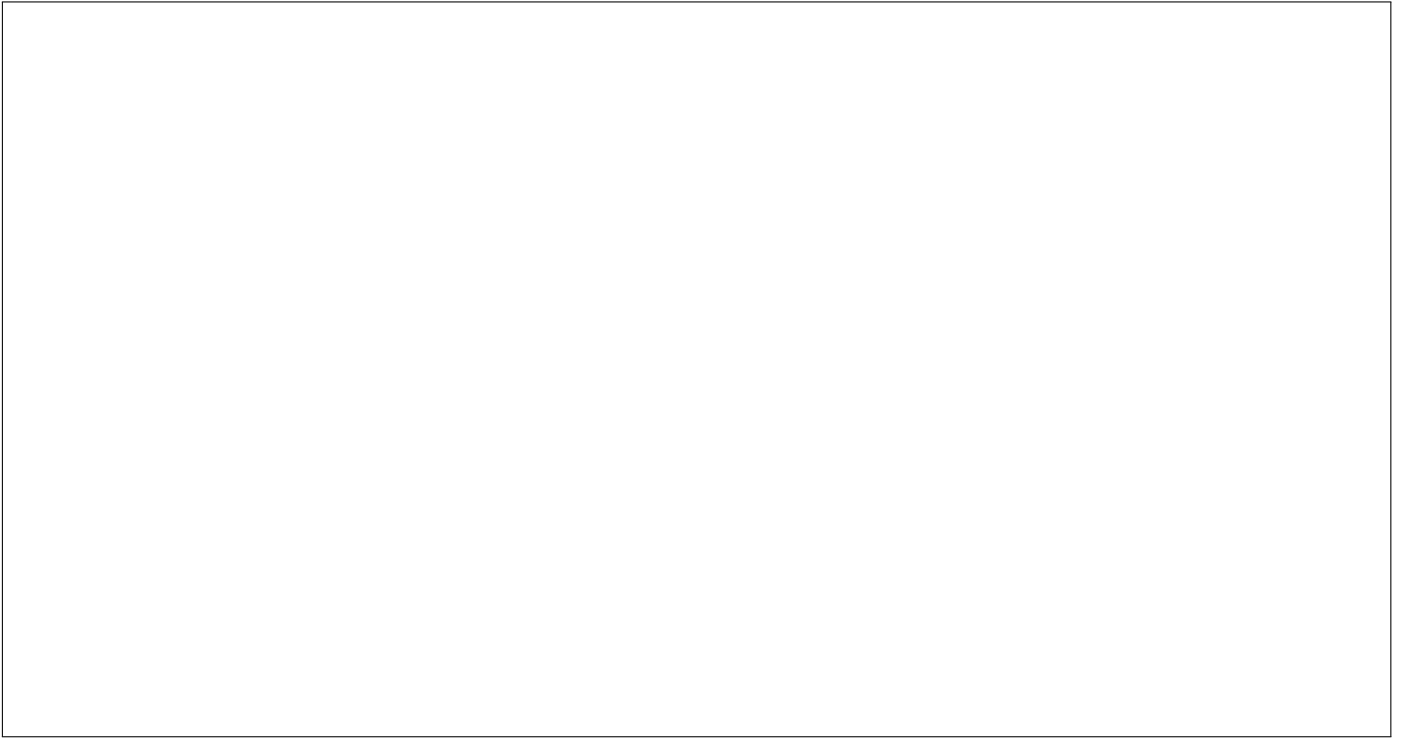e) $f(2x)$

10. Find the inverse of $f(x) = \dfrac{x}{x-2}$.

11. Find the inverse of $f(x) = \dfrac{2x+3}{5x+4}$.

12. Verify that $f(x) = \dfrac{x}{2+x}$ and $g(x) = \dfrac{2x}{1-x}$ are inverses of each other.

13. Verify that $f(x) = \dfrac{-x-a}{1-x}$, $x \neq 1$ is its own inverse.

14. Write the equation in slope-intercept form for a line parallel to $f(x) = -5x - 3$ and passing through the point $(2, -12)$.

15. Write the equation in slope-intercept form for a line perpendicular to $f(x) = -2x + 4$ and passing through the point $(-4, -1)$.