Occidental College Department of Mathematics Gateway – Functions (practice)

C.,,,,,,,,	Date:	No. 200 o.	
Course:	Date:	Name:	

Neatly present all of your work on this (or additional) sheets.

- 1.-3. The function Q is given by the formula $Q(x) = 3x^2 + 2x$.
- 1. Find Q(-3)

2. Find Q(a+b)

3. Find $\frac{Q(x + \Delta x) - Q(x)}{\Delta x}$

4. For the functions $f(x) = x^2$ and $g(x) = x^{\frac{1}{3}} - 2$, find $(f \circ g)(x) = f(g(x))$.

5. Find functions f(x) and g(x) so that $h(x) = \sqrt{3x^2 - 2x}$ is the composition $(g \circ f)(x) = g(f(x))$.

6. Write an expression for the following statement: The function G is four times the sum of the functions jand k.

7. Let
$$f(x) = x^2$$
, $g(x) = x^{\frac{1}{3}}$ and $h(x) = 3x - 1$. Find an formula for $\left(\frac{g - h}{g - f}\right)(x)$.

8. The table below contains values of the functions f and g for the given x-values:

x	f(x)	g(x)	
-2	3	17	
-1	2	2	$Find (9a \times f)(9)$
0	1	8	Find $(2g \times f)(2)$
1	0	5	
2	-1	3	

Find
$$(2g \times f)(2)$$

9. Find the domain of the function $w(x) = \frac{\sqrt{x-1}}{x-2}$.

10. Given the function $P(x,y) = \sqrt{x^2 + y^2}$ and the constraint that $y^2 = x$ for all x, express the function P as a function of one variable.