Name: _____ Date: _____ Class: _____

Function Notation Worksheet

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Use the given information to complete each problem. Show your work where needed.

Key Ideas:

- $f(x)$ means "the function f of x".
- The input (x) is the value you put in.
- The output is the result.
- Common notation: $f(x)$, $g(x)$, $h(x)$, etc.

Examples:

If $f(x) = 2x + 3$, then $f(4) = 2(4) + 3 = 11$.

If $g(x) = x^2 - 5$, then $g(-2) = (-2)^2 - 5 = 4 - 5 = -1$.

Function Types:

- Linear: $f(x) = mx + b$
- Quadratic: $f(x) = ax^2 + bx + c$
- Rational: $f(x) = \frac{x}{x - 1}$
- Absolute value: $f(x) = |x|$

1. Evaluate the function for the given value.

a) $f(x) = 3x + 5$, $f(2) =$ _____

b) $g(x) = x^2 - 4$, $g(-3) =$ _____

c) $h(x) = 5x - 7$, $h(0) =$ _____

d) $p(x) = 2x^2 + 1$, $p(4) =$ _____

e) $q(x) = -x + 6$, $q(-5) =$ _____

f) $r(x) = 4 - 2x$, $r(3) =$ _____

2. Find the value of the indicated function.

a) $f(x) = 6x - 8$, find $f(7) =$ _____

b) $g(x) = x^2 + 3x$, find $g(-4) =$ _____

c) $h(x) = \frac{1}{2}x - 5$, find $h(10) =$ _____

d) $p(x) = x^3$, find $p(-2) =$ _____

e) $q(x) = |x - 3|$, find $q(9) =$ _____

f) $r(x) = \frac{x + 1}{2}$, find $r(5) =$ _____

3. Find the domain of each function.

a) $f(x) = 2x + 1$ Domain: _____

b) $g(x) = x^2 - 4$ Domain: _____

c) $h(x) = \frac{1}{x - 3}$ Domain: _____

d) $p(x) = \sqrt{x}$ Domain: _____

e) $q(x) = |x - 5|$ Domain: _____

f) $r(x) = \frac{x + 2}{x^2 - 1}$ Domain: _____

4. Find the range of each function.

a) $f(x) = 3x + 2$ Range: _____

b) $g(x) = x^2$ Range: _____

c) $h(x) = -x + 4$ Range: _____

d) $p(x) = |x|$ Range: _____

e) $q(x) = \frac{2}{x}$ Range: _____

f) $r(x) = x^2 - 9$ Range: _____

5. Complete the table of values for each function.

a) $f(x) = 2x - 3$

x	−2	−1	0	1	2
f(x)					

b) $g(x) = x^2 + 1$

x	−2	−1	0	1	2
g(x)					

c) $h(x) = 5 - x$

x	−1	0	1	2	3
h(x)					

6. Write the function rule for each situation.

a) A number is multiplied by 4 and then 7 is added.
$f(x) =$ _____

b) A number is squared and then 5 is subtracted.
$f(x) =$ _____

c) A number is divided by 3.
$f(x) =$ _____

d) The absolute value of a number.
$f(x) =$ _____

e) A number is increased by 9 and then doubled.
$f(x) =$ _____

f) A number is decreased by 6 and then squared.
$f(x) =$ _____

7. Use function notation to write each expression.

a) The square of x: _____

b) 7 more than x: _____

c) 5 times x, then subtract 2: _____

d) The reciprocal of x: _____

e) The square root of x: _____

f) The absolute value of $x - 4$: _____

8. Solve for the given variable.

a) If $f(x) = 3x - 5$ and $f(x) = 16$, find x. _____

b) If $g(x) = x^2 + 4$ and $g(x) = 20$, find x. _____

c) If $h(x) = 2x + 7$ and $h(x) = -5$, find x. _____

d) If $p(x) = \frac{x + 3}{2}$ and $p(x) = 7$, find x. _____

e) If $q(x) = |x - 4|$ and $q(x) = 9$, find x. _____

9. Real-world problem.

A company's profit is modeled by $P(x) = 50x - 200$, where x is the number of units sold. What is the profit when $x = 10$?

_____

10. Challenge.

a) If $f(x) = x^2 - 6x + 8$, find $f(-1)$. _____

b) If $g(x) = 3x - 4$ and $g(x) = 11$, find x. _____

c) If $h(x) = \frac{x - 2}{x + 1}$, what value of x makes $h(x)$ undefined? _____