1.5 Combining Functions

Ex. ① Suppose that

$$f(x) = -x^2 + 4$$

and

$$g(x) = x - 2$$

Find the following:

a) $f(1) + g(1) =$

b) $f(0) + g(0) =$
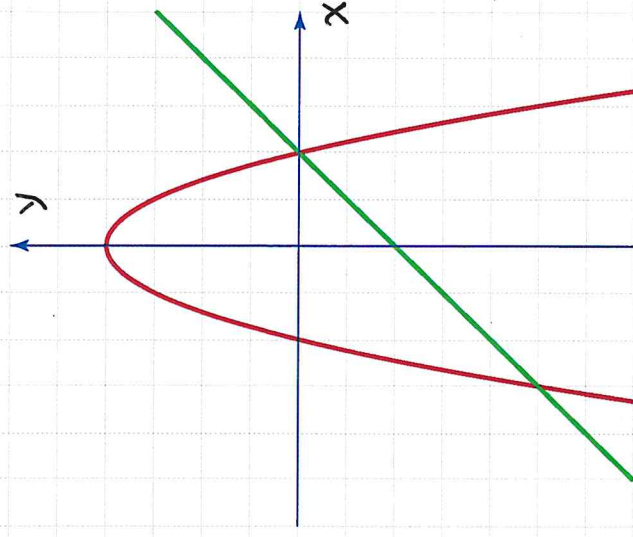
c) $f(-1) + g(-1) =$

d) $f(-2) + g(-2) =$

Notation:

e) $(f + g)(3) =$

f) $(f + g)(x) =$

g) $(f + g)(3) =$

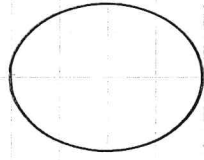h) $(f - g)(x) = f(x) - g(x)$

i) $(f \cdot g)(x) = f(x) \cdot g(x)$

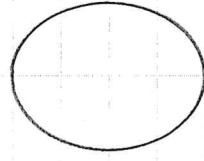j) $(f/g)(x) = \dfrac{f(x)}{g(x)}$

k) Find the domain of $(f/g)(x)$

Definition: The composition of the function f with the function g

is given by: $(f \circ g)(x) = f(g(x))$.
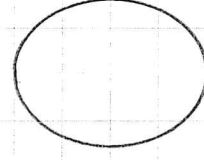
Ex. ② Let $f(x) = x^2$ and $g(x) = \sqrt{x-1}$

Find: a) $(f \circ g)(5) =$

Domain of g Range of g Range of f

Domain of f

b) $(f \circ g)(7) =$

c) $(f \circ g)(-1) =$

d) $(f \circ g)(x) =$

e) $(g \circ f)(5) =$

Ex. ③ Given a function $C(x)$, find functions f and g

so that $C(x) = (f \circ g)(x)$

a) $C(x) = |x + 4|$

b) $C(x) = \sqrt{x^2 + 1}$