2 b, c, d $\quad f(x) = x^2 - 4$

b) $f(a+5)$

$f(a+5) = (a+5)^2 - 4$

$= (a+5)(a+5) - 4$

$= a^2 + 10a + 25 - 4$

$= a^2 + 10a + 21$

c) $(f(a-1)$

$= (a-1)^2 - 4$

$= (a-1)(a-1) - 4$

$= a^2 - 1a - 1a + 1 - 4$

$= a^2 - 2a - 3$

d) $f(a^2 - 2)$

$= (a^2 - 2)^2 - 4$

$= (a^2 - 2)(a^2 - 2) - 4$

$= a^4 - 4a^2 + 4 - 4$

$= a^4 - 4a^2$

1.4 Composite Functions

def: A Composite Function is a combination of two (or more) functions.

The composition of the function f with the function g is written as $f(g(x))$, which is read as "f of g of x", or $(f \circ g)(x)$, which is read as "f composed with g of x".

Ex 1 Consider $f(x) = 3x^2 + 2x + 1$

Evaluate for

a) 3

$f(3) = 3(3)^2 + 2(3) + 1$

$= 34$

b) K

$f(K) = 3K^2 + 2K + 1$

c) $x+1$

$f(x+1)$

$= 3(x+1)^2 + 2(x+1) + 1$

$3(x+1)(x+1) + 2x + 2 + 1$

$3(x^2 + 2x + 1) + 2x + 3$

$3x^2 + 6x + 3 + 2x + 3$

* let $g(x) = x+1$

Find $f(g(x))$

$3x^2 + 8x + 6$

Ex $f(x) = 5 - 3x$ and $g(x) = x^2 + 4$

find $(g \circ f)(3)$

$= g(f(3))$

$f(3) = 5 - 3(3)$
$= 5 - 9$
$= -4$

$= g(-4)$

$= (-4)^2 + 4$

$= 16 + 4$

$= 20$

-4^2 $(-4)^2$

HW IF p15
1, 2, 5, 6
do 1/2
9 then
alternate