

CH 6

Act 1

3

$$a) (f+g)(3) = f(3) + g(3) = 7 + 4 = 11$$

$$(f-g)(1) = f(1) - g(1) = (-1) - 2 = -3$$

$$(f \cdot g)(2) = f(2) \cdot g(2) = 2 \cdot 3 = 6$$

$$\left(\frac{f}{g}\right)(4) = \frac{f(4)}{g(4)} = \frac{14}{5}$$

$$\left(\frac{f}{g}\right)(-1) = \frac{f(-1)}{g(-1)} \neq$$

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

$$(f-g)(x) = f(x) - g(x) = (x^2 - 2) - (x + 1) = x^2 - x - 3$$

$$(f \cdot g)(x) = f(x) \cdot g(x) = (x^2 - 2)(x + 1) = x^3 + x^2 - 2x - 2$$

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{x^2 - 2}{x + 1}$$

$$c) D_{f+g} = \mathbb{R} (= D_f \cap D_g)$$

$$D_{f-g} = \mathbb{R} (= D_f \cap D_g)$$

$$D_{f \cdot g} = \mathbb{R} (= D_f \cap D_g)$$

$$D_{\frac{f}{g}} = \mathbb{R} \setminus \{-1\} (= D_f \cap D_g \setminus \{x_g\})$$

Act 2

1)

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

$$f(x) = \frac{2}{1-x}$$

$$f(x) = \frac{3x}{2+x}$$

i)

$$t^2 + 1$$

$$\frac{2}{1-t}$$

$$\frac{3-t}{2+t}$$

ii)

$$(t+2)^2 + 1 = t^2 + 4t + 5$$

$$\frac{2}{1-(t+2)} = \frac{2}{-t-1}$$

$$\frac{3-(t+2)}{2+(t+2)} = \frac{1-t}{4+t}$$

iii)

$$x^2 + 4x + 5$$

$$\frac{2}{-x-1}$$

$$\frac{1-x}{4+x}$$

iv)

$$(x+t)^2 + 1 = x^2 + 2xt + t^2 + 1$$

$$\frac{2}{1-(x+t)} = \frac{2}{1-x-t}$$

$$\frac{3-(x+t)}{2+(x+t)} = \frac{3-x-t}{2+x+t}$$

v)

$$x^2 + 1$$

$$\frac{2}{1+x}$$

$$\frac{3+x}{2-x}$$

$$vi) \quad 9x^2 + 1$$

$$\frac{2}{1-3x}$$

$$\frac{3-3x}{2+3x}$$

$$vii) \quad x+1$$

$$\frac{2}{1-\sqrt{x}}$$

$$\frac{3-\sqrt{x}}{2+x}$$

$$viii) \quad \frac{1}{x^2+1}$$

$$\frac{2}{1-\frac{1}{x}} = \frac{2x}{x-1} \quad \uparrow \quad x \neq 0$$

$$\frac{3-\frac{1}{x}}{2+\frac{1}{x}} = \frac{3x-1}{2x+1} \quad \uparrow \quad x \neq 0$$

$$\boxed{2} \quad a) \quad f(5) \cong 4$$

$$d) \quad f(3) = 0$$

$$b) \quad g(0) = 3$$

$$e) \quad g(1) = 4$$

$$c) \quad g(2) = 5$$

$$f) \quad f(2) = -2$$

$$\boxed{3} \quad f \circ g(x) = f(g(x)) = f(x^2-2) = 3(x^2-2)+1 = 3x^2-5$$

$$g \circ f(x) = g(f(x)) = g(3x+1) = (3x+1)^2-2 = 9x^2+6x-1$$

$$f \circ f(x) = f(f(x)) = f(3x+1) = 3(3x+1)+1 = 9x+4$$

$$g \circ g(x) = g(g(x)) = g(x^2-2) = (x^2-2)^2-2 = x^4-2x^2+2$$

$$f \circ h(x) = f\left(\frac{3x}{x-2}\right) = 3\left(\frac{3x}{x-2}\right)+1 = \frac{9x}{x-2}+1 = \frac{10x-2}{x-2}$$

$$h \circ f(x) = h(f(x)) = h(3x+1) = \frac{3(3x+1)}{(3x+1)-2} = \frac{9x+3}{3x-1}$$

$$h \circ h(x) = h\left(\frac{3x}{x-2}\right) = \frac{3\left(\frac{3x}{x-2}\right)}{\frac{3x}{x-2}-2} = \frac{\frac{9x}{x-2}}{\frac{3x-2(x-2)}{x-2}} = \frac{9x}{x-2} \cdot \frac{x-2}{x+4} = \frac{9x}{x+4} \quad \uparrow \quad x \neq 2$$

Act 3

janvier : +50. - + 3% ou 3% puis 50. -

$$(a) \quad x : \text{salaire} \quad f_1(x) = x + 50 \quad f_2(x) = x \cdot (1,03)$$

$$(b) \quad f_2 \circ f_1(x) = f_2(x+50) = (x+50) \cdot (1,03) = 1,03x + 1,03 \cdot 50$$

$$(c) \quad f_1 \circ f_2(x) = f_1(1,03x) = 1,03x + 50$$

$$(d) \quad 50. - \text{ puis } 3. -$$

(e) pas égal !