

2<sup>nd</sup> exercise: 1)  $X$  is defined for all real values of:  
a except  $a = -1$   
& b except  $b = -1$ .

2a)  $X = \frac{1}{a+1} + \frac{1}{b+1}$

$X = 0$

so  $\frac{1}{a+1} + \frac{1}{b+1} = 0$

(-)

$\frac{b+1 + a+1}{(a+1)(b+1)} = 0$

Thus,  $\boxed{a+b = -2}$

b)  $Y = \frac{1}{a} + \frac{1}{b}$

(-)

$Y = \frac{1}{3}$

Then,  $\frac{1}{a} + \frac{1}{b} = \frac{1}{3}$

so,  $\frac{a+b}{ab} = \frac{1}{3}$

but,  $a+b = -2$  (proved)

so,  $\frac{-2}{ab} = \frac{1}{3}$

Thus  $\boxed{ab = -6}$

c) (-)

$$\begin{aligned} a^2 + b^2 &= (a+b)^2 - 2ab \\ &= (-2)^2 - 2(-6) \\ &= 4 + 12 \end{aligned}$$

$\boxed{a^2 + b^2 = 16}$