Solution of Recitation - R.5 **Done by: A. Al-Shallali**

Q1) (a) $$= \frac{x}{(x+1)(x+2)} + \frac{3\cancel{(x-1)}}{\cancel{(x-1)}(x+1)} = \frac{x}{(x+1)(x+2)} + \frac{3}{x+1} = \frac{x+3(x+2)}{(x+1)(x+2)}$$

$$= \frac{4x+6}{(x+1)(x+2)} = \frac{2(2x+3)}{(x+1)(x+2)}$$

(b) $$= \frac{\dfrac{x^2}{x-4}+2}{\dfrac{2x-2}{x}-1} \cdot \frac{x(x-4)}{x(x-4)} = \frac{x^3+2x(x-4)}{(x-4)(2x-2)-x(x-4)} = \frac{x(x^2+2x-8)}{(x-4)(2x-2-x)}$$

$$= \frac{x(x+4)\cancel{(x-2)}}{(x-4)\cancel{(x-2)}} = \frac{x(x+4)}{x-4}$$

(c) $$= \frac{x}{x+5} + \frac{x}{\cancel{x-4}} \cdot \frac{\cancel{(x-4)}(x+3)}{x+2} = \frac{x}{x+5} + \frac{x(x+3)}{x+2} = \frac{x(x+2)+x(x+3)(x+5)}{(x+5)(x+2)}$$

$$= \frac{x(x+2+x^2+8x+15)}{(x+5)(x+2)} = \frac{x(x^2+9x+17)}{(x+5)(x+2)}$$

Q2) $$= 2 + \cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{x}} \cdot \cfrac{x}{x}} = 2 + \cfrac{1}{2+\cfrac{x}{x+1}} = 2 + \cfrac{1}{2+\cfrac{x}{x+1}} \cdot \frac{x+1}{x+1} = 2 + \frac{x+1}{2x+2+x}$$

$$= 2 + \frac{x+1}{3x+2} = \frac{6x+4+x+1}{3x+2} = \frac{7x+5}{3x+2}$$

Q3) $$= \left[1-\frac{4xy}{x^2+2xy+y^2}\right] \div \left[1+\frac{4xy}{x^2-2xy+y^2}\right] = \left[\frac{x^2+2xy+y^2-4xy}{x^2+2xy+y^2}\right] \div \left[\frac{x^2-2xy+y^2+4xy}{x^2-2xy+y^2}\right]$$

$$= \left[\frac{x^2-2xy+y^2}{x^2+2xy+y^2}\right] \cdot \left[\frac{x^2-2xy+y^2}{x^2+2xy+y^2}\right] = \frac{(x-y)^2}{(x+y)^2} \cdot \frac{(x-y)^2}{(x+y)^2} = \left(\frac{x-y}{x+y}\right)^4.$$

So the answer is part (c).

Q4) $$= \frac{(a+b+c)^2-(b-c)^2}{a+2c} = \frac{[(a+b+c)+(b-c)][(a+b+c)-(b-c)]}{a+2c} = \frac{(a+2b)\cancel{(a+2c)}}{\cancel{a+2c}}$$

$= a+2b$. So the answer is part (c).