

a) Tìm x, y, z biết $\frac{x-1}{2} = \frac{y-3}{4} = \frac{z-2}{3}$ và $x-3y+4z=4$.

b) Cho a, b, c thỏa mãn $\frac{b-c}{(a-b)(a-c)} + \frac{c-a}{(b-a)(b-c)} + \frac{a-b}{(c-a)(c-b)} = 2022$

Tính giá trị biểu thức $Q = \frac{1}{a-b} + \frac{1}{b-c} + \frac{1}{c-a}$.

HD:

a)

$$\frac{x-1}{2} = \frac{y-3}{4} = \frac{z-2}{3} = \frac{x-1}{2} = \frac{3y-9}{12} = \frac{4z-8}{12} = \frac{x-1-3y+9+4z-8}{2-12+12} = 2$$
$$\frac{x-1}{2} = 2 \Rightarrow x=5; \frac{y-3}{4} = 2 \Rightarrow y=11; \frac{z-2}{3} = 2 \Rightarrow z=8$$

Vậy $x=5; y=11; z=8$

b)

$$\frac{b-c}{(a-b)(a-c)} + \frac{c-a}{(b-a)(b-c)} + \frac{a-b}{(c-a)(c-b)} = 2022$$
$$\Rightarrow \frac{(b-a)-(c-a)}{(a-b)(a-c)} + \frac{(c-b)-(a-b)}{(b-a)(b-c)} + \frac{(a-c)-(b-c)}{(c-a)(c-b)} = 2022$$
$$\Rightarrow \frac{1}{c-a} + \frac{1}{a-b} + \frac{1}{a-b} + \frac{1}{b-c} + \frac{1}{b-c} + \frac{1}{c-a} = 2022$$
$$\Rightarrow 2\left(\frac{1}{a-b} + \frac{1}{b-c} + \frac{1}{c-a}\right) = 2022$$

Vậy $\frac{1}{a-b} + \frac{1}{b-c} + \frac{1}{c-a} = 1011$