$$\frac{x+1}{3x^2-4x+1}+\frac{2x-5}{9x^2-9x+2}=\frac{2}{3x-1}$$

$3x^2-4x+1=0$

$\frac{\Delta}{4}=4-3=1 \qquad x_{1,2}=\frac{2\pm 1}{3}$ → 1, → $\frac{1}{3}$

$3(x-1)\left(x-\frac{1}{3}\right)=(x-1)(3x-1)$

$9x^2-9x+2=0$

$\Delta=81-72=9 \qquad x_{1,2}=\frac{9\pm 3}{18}$ → $\frac{2}{3}$, → $\frac{1}{3}$

$9\left(x-\frac{2}{3}\right)\left(x-\frac{1}{3}\right)=(3x-2)(3x-1)$

$$\frac{x+1}{(x-1)(3x-1)}+\frac{2x-5}{(3x-2)(3x-1)}-\frac{2}{3x-1}=0$$

$$\frac{(x+1)(3x-2)+(2x-5)(x-1)-2(x-1)(3x-2)}{(x-1)(3x-1)(3x-2)}=0$$

C.E. $x\neq 1$; $x\neq\frac{1}{3}$; $x\neq\frac{2}{3}$

$3x^2 - 2x + 3x - 2 + 2x^2 - 2x - 5x + 5 - 6x^2 + 4x + 6x - 4 = 0$

$-x^2 + 4x - 1 = 0$

$x^2 - 4x + 1 = 0$

$\Delta = 4 - 1 = 3$

4

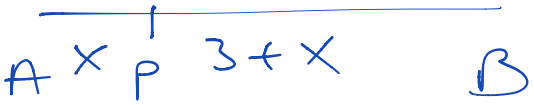
$x_{1,2} = 2 \pm \sqrt{3}$

$\overline{PB} - \overline{AP} = 3$

$\overline{AP}^2 + \overline{AP} \cdot \overline{PB} =$

$= 44$

$\overline{PB} = 3 + x$



$x^2 + x(3+x) = 44$

$x^2 + 3x + x^2 - 44 = 0$

$2x^2 + 3x - 44 = 0$

$x^2 - 5x + k + 1 = 0$

$a = 1$

$b = -5$

$c = k + 1$

a) $\Delta = 0$

$\Delta = 25 - 4(k+1) = 25 - 4k - 4 =$

$= 21 - 4k = 0 \qquad k = \frac{21}{4}$

b) $x_1 x_2 > 0$

$k + 1 > 0 \Rightarrow k > -1$

c) $x_1 x_2 = x_1 + x_2$

$\frac{c}{a} = -\frac{b}{a}$

$k + 1 = 5 \Rightarrow k = 4$

d) $\frac{1}{x_1} + \frac{1}{x_2} = 3$

$\frac{x_1 + x_2}{x_1 x_2} = 3 \qquad \frac{-\frac{b}{a}}{\frac{c}{a}} = 3$

$$-\frac{b}{c} = 3 \qquad \frac{5}{k-1} = 3$$

$$5 = 3k - 3 \Rightarrow k = \frac{8}{3}$$

e) $$\frac{1}{x_1^2} + \frac{1}{x_2^2} = \frac{7}{5}$$

$$\frac{x_1^2 + x_2^2}{x_1^2 x_2^2} = \frac{7}{3}$$

$$\frac{(x_1 + x_2)^2 - 2x_1x_2}{x_1^2 x_2^2} = \frac{7}{5}$$

$$\frac{25 - 2(k+1)}{(k+1)^2} = \frac{7}{5}$$

$k \neq -1$

$$125 - 10k - 10 = 7k^2 + 14k + 7$$

$$7k^2 + 24k - 108 = 0$$

$$\frac{\Delta}{4} = 144 + 756 = 900 = 30^2$$

$$k_{1,2} = \frac{-12 \pm 30}{7}$$

$$\frac{18}{7}$$

$$\frac{-42}{7} = -6$$