

$$a^x + xa = a^x - k \Rightarrow xa = -k \Rightarrow a = -\frac{k}{x} \quad \leftarrow \text{سؤال 1) سؤال 2) سؤال 3) سؤال 4) سؤال 5)}$$

$$g(x) = k + b = k \Rightarrow b = 0 \quad f(x) = \frac{x^2 + a}{x^2 + 1} = \frac{k + a}{1} = k \Rightarrow k + a = k \Rightarrow a = 0$$

$$f(1) = \frac{1 + 1}{1 + 1} = \frac{2}{2} = 1 = k$$

سؤال 3) سؤال 4) سؤال 5)

$$\begin{cases} x - a + b = 0 \\ 2x + ka + b = 0 \end{cases} \Rightarrow \begin{cases} 2x + ka + b = x - a + b \\ \Rightarrow a = -k \Rightarrow a = -1, b = -1 \end{cases}$$

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

سؤال 4) سؤال 5)

$$-kx^2 + ax + b = 0 \Rightarrow kx^2 - ax - b = 0$$

$$(kx + 1)^2 = 0 \Rightarrow kx^2 + 2x + 1 = 0 \Rightarrow a = -2, b = -1$$

$$a + b = -2 - 1 = -3$$

سؤال 5)

$$\Delta < 0 \Rightarrow x^2 + mx + 1 \Rightarrow m^2 - 4 < 0 \Rightarrow m^2 < 4 \Rightarrow m^2 < 2^2 \Rightarrow -2 < m < 2$$

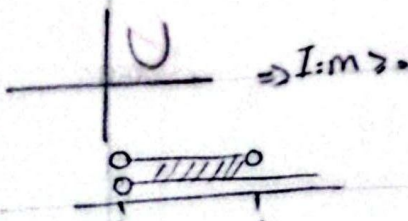
سؤال 6)

$$I = x^2 > 0 \Rightarrow x > 0$$

$$II = k - \frac{1}{x^2} > 0 \Rightarrow k > \frac{1}{x^2} \Rightarrow x^2 > \frac{1}{k} \Rightarrow -\frac{1}{\sqrt{k}} < x < \frac{1}{\sqrt{k}}$$

$$I \cap II = (-\infty, -\frac{1}{\sqrt{k}}) \cup (\frac{1}{\sqrt{k}}, +\infty)$$

سؤال 7)



$$I \cap II = [0, 1]$$

$$I = \Delta < 0 \Rightarrow f(m^2 - 1)(1) < 0 \Rightarrow f(m^2) - f(m) < 0$$

$$f(m^2) < f(m) \Rightarrow \frac{1}{m^2 - 1} < \frac{1}{m} \Rightarrow [0, 1]$$

$$\frac{(10x+1)(10x-1)}{(10x-1)} \Rightarrow a = \frac{1}{10}$$

سؤال 8

$$g\left(\frac{1}{10}\right) = 1 \times \frac{1}{10} + 1 \times 1 \Rightarrow f\left(\frac{1}{10}\right) + k = 1 \Rightarrow k = 0$$

$$a+k = \frac{1}{10}$$

$$\frac{(10x+1)(10x-1)}{10x+1}$$

$$\left\{ \begin{aligned} 10\left(\frac{-1}{10}\right)a + 1 &= -1 \Rightarrow a = \frac{1}{10} \\ f\left(\frac{-1}{10}\right) &= g\left(\frac{-1}{10}\right) \Rightarrow 10a - 1 = 10a + b \\ &\Rightarrow b = -1 \end{aligned} \right.$$

سؤال 9

$$g(x) = f \Rightarrow 10a^x + 10a = f \Rightarrow a^x + a = 1$$

سؤال 10

$$a^x + a - 1 = 0 \Rightarrow (a+1)(a-1) = 0 \Rightarrow a = 1 \vee a = 0$$