

$$x^2 + 7x = ax - c \quad \text{if } x = a \Rightarrow a^2 + 7a = a^2 - c \Rightarrow 7a = -c \Rightarrow a = -\frac{c}{7}$$

$$g(x) = 7x + b \xrightarrow{x=2} 2 = 14 + b \Rightarrow b = -12$$

$$\Rightarrow f(x) = \frac{x^2 + a}{7x - b} \Rightarrow 2 = \frac{4 + a}{14} \Rightarrow a = 14$$

$$f(1) = \frac{1 + 14}{7(-1)} = \frac{15}{-7} = -\frac{15}{7}$$

$$\begin{aligned} 2 - a + b &= 0 & -a + b &= -2 & a - b &= 2 \\ 7(2) + 7a + b &= 0 & 14a + b &= -14 & 14a + b &= -14 \\ & & & & a &= -1, b = -12 \end{aligned}$$

$$\Rightarrow f(1) = \frac{1 + 1}{7(-1) - 12} = \frac{2}{-19}$$

$$-4(-1)^2 + a(-1) + b = 0 \Rightarrow -4 - a + b = 0 \Rightarrow a - b = -4$$

$$\begin{aligned} \Delta = 0 \Rightarrow a^2 + 14b &= 0 & 14a - 14b &= -44 \\ & \Rightarrow a^2 + 14b = 0 & a^2 + 14a &= -44 \Rightarrow a^2 + 14a + 44 = 0 \Rightarrow (a+1)^2 = 0 \\ & & & \Rightarrow a = -1, b = -5 \\ & & & a + b = -1 - 5 = -6 \end{aligned}$$

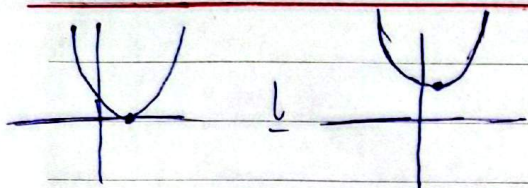
$$x^2 + mx + 1 \xrightarrow{\Delta=0} m^2 - 4 < 0 \Rightarrow (m-2)(m+2) < 0$$

$$\Rightarrow \begin{array}{c} -2 & 2 \\ + \phi & - \phi + \end{array} \Rightarrow m \in (-2, 2)$$

$$x - \frac{1}{x} > 0 \Rightarrow x^2 - 1 > 0 \Rightarrow (x-1)(x+1) > 0$$

-9

$$\Rightarrow +\phi - \phi + \Rightarrow \mathbb{R} - \left(-\frac{1}{x}, \frac{1}{x}\right)$$



$$a > 0 \Rightarrow m > 0 \quad \text{I}$$

-V

$$\Delta = 0 \Rightarrow x^2 - 1 = 0 \Rightarrow x^2(x-1) = 0 \Rightarrow x < 1 \quad \text{II}$$

$$\Delta < 0 \Rightarrow x^2 - 1 < 0 \Rightarrow x^2(x-1) < 0 \Rightarrow +\phi - \phi + \Rightarrow m \in (0, 1) \quad \text{III}$$

III

$$\Rightarrow \bigcap_{I \cap II \cap III} = m \in [0, 1]$$

$$\frac{x^2 - 1}{x - 1} \Rightarrow x - 1 \neq 0 \Rightarrow x \neq 1 \Rightarrow x \neq \frac{1}{x} \Rightarrow a = \frac{1}{x}$$

-A

$$x + k = x + 1 \xrightarrow{x = \frac{1}{x}} x + k = x \Rightarrow k = 0 \quad a + k = \frac{1}{x} + 0 = \frac{1}{x}$$

$$x^2 + ax = x + x \xrightarrow{x = \frac{1}{x}} x^2 + a = x + x \Rightarrow a + a = 4$$

-9

$$\Rightarrow a^2 + a - 4 = 0 \Rightarrow (a+4)(a-1) = 0 \Rightarrow a < 1$$

$$\text{if } x = \frac{1}{x} \Rightarrow -x + x = -x + b \Rightarrow -x - b = -x$$

-10

$$\text{if } x = -1 \Rightarrow \frac{4(-1)^2 - 4}{2(-1) + c} = 2(-1) + b \Rightarrow -4 = -2 + b \Rightarrow b = -2 \Rightarrow -x - (-2) = -x$$

$$\Rightarrow -x = -2 \Rightarrow a = 2$$

$$a - b = 2 - (-2) = 4$$