

$(x-1)(x-3) = x^2 - 4x + 3$
 $x^2 - ax + b$

$\rightarrow a+b = 4+3 = \underline{7}$

$(x-3)^2 \quad x=-1 \rightarrow -1-3n = 0 \rightarrow n = \underline{-\frac{1}{3}}$

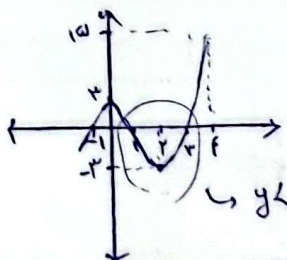
$y = ax + b \rightarrow a < 0 \rightarrow k - 2 < 0 \rightarrow 2 < 2 \quad k \in \mathbb{N} \rightarrow k = 1$

$x = f \rightarrow (1-2)(f) + m - 1 = 0 \rightarrow m = 1$
 $\frac{m}{n} + k = \frac{1}{-\frac{1}{3}} + 1 = \underline{-1f}$

$-\frac{1}{3}x^2 + 2x + 4 > \frac{1}{3} \rightarrow -\frac{1}{3}x^2 + 2x + 4 - \frac{1}{3} > 0 \rightarrow -\frac{1}{3}x^2 + 2x + \frac{11}{3} > 0$
 $-\frac{1}{3}x^2 + 2x + \frac{11}{3} = 0 \xrightarrow{\times -3} x^2 - 6x - 11 = 0 \rightarrow (x-7)(x+1) = 0 \xrightarrow{\times -\frac{1}{3}} (-\frac{x}{3} + \frac{11}{3})(x+1) = 0$
 $\xrightarrow{> 0} (-1, 7) \rightarrow b-a = 7 - (-1) = \underline{8}$

$x > 0, y < 0, p(x) = x^3 - 3x^2 - x + 3 \rightarrow (a, b)$

$x=0 \rightarrow 3$
 $x=1 \rightarrow 1-3-1+3=0$
 $x=2 \rightarrow 8-12-2+3=-3$
 $x=3 \rightarrow 27-27-3+3=0$
 $x=4 \rightarrow 64-48-4+3=15$
 $x=-1 \rightarrow -1-3+1+3=0$



$y < 0, x > 0 \rightarrow (1, 3) \rightarrow$ تقاطعی: ۲
 $\rightarrow x=2 \Rightarrow f = \underline{-3}$

$(a-1)x^2 + (a-1)x + 1 = 0$

$a < 0 \rightarrow a-1 < 0 \rightarrow a < 1 \rightarrow \text{ع. ر} = (-\infty, 1) \text{ ①}$

$\Delta < 0 \rightarrow (a-1)^2 - 4(a-1) < 0 \rightarrow a^2 - 2a + 1 < 0 \rightarrow (a-1)(a-1) < 0 \rightarrow (1, 1) \text{ ②}$

$\text{①, ②} \rightarrow \emptyset \rightarrow \underline{a \in \emptyset}$
 $\frac{1}{+p-4+}$

$$\frac{m^r(m^r+1)}{m-r} > 0 \rightarrow \frac{0^*}{-\phi - \frac{r}{\phi} +} \rightarrow m, \omega = (r, +\infty)$$

6

$$\frac{(\lambda-r)(\lambda+r)(\lambda-1)^r}{(\lambda^r+\lambda+1)(r-\lambda)^r} < 0$$

	-r	1*	r	r		
$(\lambda-r)/\lambda^r$	+	0	-	-	0	+
$(\lambda-1)^r$	+	+	0	+	+	+
$(r-\lambda)^r$	+	+	+	0	-	-
$(\lambda^r+\lambda+1)$	+	+	+	+	+	+
\rightarrow $\frac{0}{\phi}$	+	0	-	0	+	0

$$\rightarrow \text{C. r} = [-r, r) \cup [r, +\infty)$$

7

$$\frac{r\lambda^r - r\lambda}{\lambda^r + r} < r \rightarrow \frac{r\lambda^r - r\lambda}{\lambda^r + r} - r < 0 \rightarrow \frac{r\lambda^r - r\lambda - r\lambda^r - r}{\lambda^r + r} < 0 \rightarrow \frac{\lambda^r - r\lambda - r}{\lambda^r + r} < 0$$

$$\rightarrow \frac{(\lambda-r)(\lambda+r)}{\lambda^r + r} < 0 \rightarrow \frac{-r}{+} \frac{r}{-} \rightarrow (-r, r)$$

(a, b) $\rightarrow b - a = r - (-r) = \boxed{4}$

8

$$\frac{r\lambda^r - r\lambda}{\lambda + 1} > -1 \rightarrow \frac{r\lambda^r - r\lambda}{\lambda + 1} + 1 > 0 \rightarrow \frac{r\lambda^r - r\lambda + \lambda + 1}{\lambda + 1} > 0$$

$$\hookrightarrow \frac{r\lambda^r - r\lambda + 1}{\lambda + 1} > 0 \rightarrow \frac{-1}{-\frac{r}{\phi} +} \rightarrow (-1, +\infty) \text{ (1)}$$

$$\frac{r\lambda^r - r\lambda}{\lambda + 1} < 0 \rightarrow \frac{r\lambda(\lambda - \frac{r}{\phi})}{\lambda + 1} < 0 \rightarrow \frac{-1}{-\frac{r}{\phi} +} \frac{\frac{r}{\phi}}{\phi} \rightarrow (-\infty, -1) \cup (0, \frac{r}{\phi}) \text{ (2)}$$

$$\text{C. r} \rightarrow (0, \frac{r}{\phi})$$

9

$$\frac{\lambda^r - 1}{\lambda} - r < 0 \rightarrow \frac{\lambda^r - r\lambda - 1}{\lambda} < 0 \rightarrow \frac{(\lambda-1)(\lambda+r)}{\lambda} < 0 \rightarrow \frac{-r}{-} \frac{0}{+} \frac{0}{-} \frac{0}{+}$$

$$\text{C. r} = (-\infty, -r] \cup (0, \infty)$$