

$x^2 - 4x + 3$
 $(x-3)(x-1)$

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

$\begin{array}{c|c|c} & 1 & 3 \\ \hline + & 0 & 0 \\ \hline & 1 & 3 \end{array}$

1

$y = ((k-2)x + m - 1)(x - 2n)^2$
 $x = -1 \rightarrow (-1(k-2) + m - 1)(-1 - 2n)^2 = 0$
 $x = k \rightarrow (k(k-2) + m - 1)(k - 2n)^2 = 0$

$(k(k-2) + m - 1) = 0$
 $k^2 + m - 9 = 0$
 $m = 9 - k^2$

$-1 - 2n = 0 \Rightarrow n = -\frac{1}{2}$
 $\frac{m}{n} = \frac{-1}{\frac{1}{2}} = -2$

$\begin{array}{c|c|c} x & -1 & \epsilon \\ \hline P & + & 0 \\ \hline & -1 & -2n \end{array}$

2

$(-\frac{1}{p}x^2 + rx + q) > \frac{v}{p}$
 $-x^2 + rx + 12 > v$
 $x^2 - rx - 12 < -v$
 $x^2 - rx - \omega < 0$

$(x-\omega)(x+1) < 0$

$\begin{array}{c|c|c} & -1 & \omega \\ \hline + & 0 & 0 \\ \hline & -1 & \omega \end{array}$

$\frac{b-a}{\omega+1} = \frac{b-a}{-1+1} = \frac{b-a}{0}$
 $(-1, \omega)$
 (a, b)

3

$x^3 - 2x^2 - x + \mu = (x-1)(x^2 - rx - c)$
 $(x-1)(x+1) = x^2 - 1$

$x \rightarrow 1, -1, \mu$

$(a, b) = (1, \mu)$
 $\frac{1+\mu}{2} = 2 \Rightarrow \mu = 3$
 $f(x) = x^3 - 2x^2 - x + 3 = (x-1)(x+1)(x-3)$

$\begin{array}{c|c|c|c} & -1 & 1 & \mu \\ \hline & 0 & + & 0 \\ \hline & -1 & 1 & \mu \end{array}$

4

$(a-1)x^2 + (a-1)x + 1$
 $a-1 < 0 \Rightarrow a < 1$
 $\Delta < 0 \Rightarrow (a, 1)$

$(a-1)^2 - 4(a-1)(1) < 0$
 $a^2 + 1 - 2a - 4a + 4 < 0$
 $a^2 - 6a + 5 < 0$
 $(a-5)(a-1) < 0$
 $a \in (1, 5)$

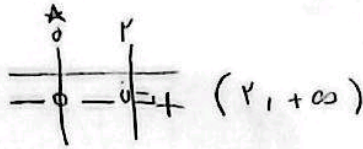
$\begin{array}{c|c|c} & 1 & \omega \\ \hline + & 0 & 0 \\ \hline & 1 & \omega \end{array}$

5

$$\frac{m(m^p + m)}{m - p} > 0$$

$$\frac{m^k + m^p}{m - p} > 0$$

$$\frac{m^p(m^p + 1)}{m - p} > 0$$

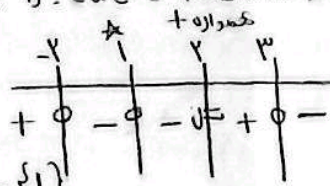


8

$$\frac{(x^p - x - 4)(x - 1)^p}{(x^p + x + 1)(x - 2)^p} \leq 0$$

$$\frac{(x - 1)^p}{(x - 2)^p} \leq 0$$

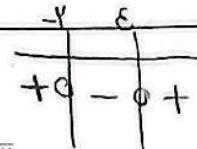
$$b^p - \epsilon ac = 1 - \epsilon(1)(1) < 0$$



$$[-1, 1) \cup (2, +\infty) - \{1\}$$

9

$$\frac{\mu x^p - p x - 1}{x^p + p} < 0 \Rightarrow (a, b) \text{ Max } b - a$$

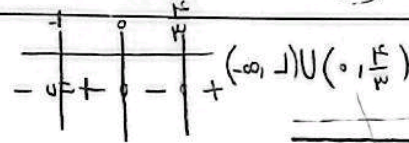


$$\frac{\mu x^p - p x - 1}{x^p + p} < 0 \quad \frac{x^p - p x - 1}{x^p + p} < 0 \quad \frac{(x - \epsilon)(x - p)}{x^p + p} < 0$$

10

$$\frac{\mu x^p - p x}{x + 1} < 0$$

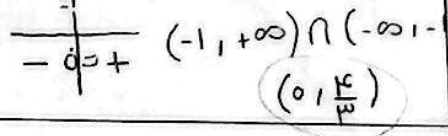
$$\mu x^p - p x = 0$$



$$\frac{\mu x^p - p x}{x + 1} + 1$$

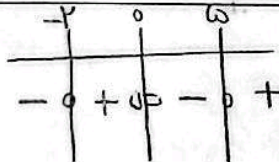
$$b^p - \epsilon ac = 9 - \epsilon(\mu)(1) < 0$$

$$0 < \frac{\mu x^p - p x + x + 1}{x + 1} \rightarrow \frac{\mu x^p - p x + 1}{x + 1} \rightarrow \frac{-1}{x + 1}$$



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$$\frac{x^p - 10}{x} \leq \mu$$



$$\frac{x^p - 10}{x} - \mu \leq 0$$

$$(-\infty, -p] \cup (0, \omega]$$

$$\frac{(x - \omega)(x + p)}{x^p - 10 - \mu x} \leq 0$$

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