

$$x^r - ax + b$$

$$1 - a + b = 0$$

$$9 - 3a + b = 0$$

$$1 < n < 3$$

$$b - a = 1$$

$$b - 3a = -9$$

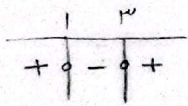
$$a + b = 9$$

$$b = a - 1$$

$$b = 3a - 9$$

$$a - 1 = 3a - 9$$

$$2a = 8 \quad b = 7$$



1
✓

$$(-k + r + m - 1)(-1 - 3n)^r = 0$$

$$(m - k + 1)(-1 - 3n)^r = 0$$

$$\begin{cases} m - k = -1 \rightarrow m = k - 1 \\ n = -\frac{1}{3} \end{cases}$$

$$(k - 1 + m - 1)(-1 - 3n)^r = 0$$

$$(k - 9 + m)(-1 - 3n)^r = 0 \Rightarrow$$

$$\begin{cases} k + m = 9 \rightarrow m = 9 - k \\ n = \frac{1}{3} \end{cases}$$

2
✓

$$y = ((k - r)n + m - 1)(n - 3n)^r$$

$$(k - r)(\frac{1}{3}) + m - 1 = 0 \quad k - r < 0 \quad 3n = -1$$

$$k < r \quad n = -\frac{1}{3}$$

$$\frac{m}{n} + k = \frac{9}{-\frac{1}{3}} + 1 = -12$$

$$k - 1 + m - 1 = 0$$

$$k + m = 9 \quad k = 1$$

$$r + m = 9 \rightarrow m = 8$$

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

$$\Delta = 4 - 4(-9) = 40 \quad x = \frac{-2 \pm \sqrt{40}}{-1} = 4 \text{ و } -2$$

$$(a, b) \text{ و } \frac{1}{2} \rightarrow \frac{1}{2} \text{ و } 0 \quad (-1, 9)$$

$$b - a =$$

$$9 - (-1) = 10$$

$$-\frac{1}{3}x^2 + 2x + 9 > \frac{1}{2}$$

$$+x^2 - 4x - 18 < 0$$

$$x = -1 \quad x = 9$$

3
✓

$$f(x) = x^3 - 3x^2 - x + 3$$

$$(a, b)$$

$$\frac{x^3 - 3x^2 - x + 3}{x^2 - 3x + 3} \begin{array}{l} x+1 \\ -x^3 + 3x^2 \\ \hline 4x^2 - x + 3 \\ -4x^2 + 12x - 12 \\ \hline 11x - 9 \end{array}$$

$$\frac{11x - 9}{x^2 - 3x + 3} \begin{array}{l} x-3 \\ -11x^2 + 33x - 33 \\ \hline 44x - 39 \\ -44x + 132 \\ \hline 93 \end{array}$$

$$\frac{93}{x^2 - 3x + 3}$$

$$f(x) = (x - 3)(x - 1)(x + 1)$$

$$x = 3, x = 1, x = -1$$

4
✓

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

$$(a - 1)^2 - 4(a - 1) < 0$$

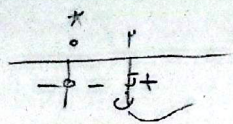
$$(a - 1)(a - 1 - 4) < 0$$

$$(a - 1)(a - 5) < 0$$

$$a = 1 \quad a = 5$$

5

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



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

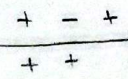
$(r, +\infty)$

$m=0$ * $m=r$

$m^r = -1 \text{ } \forall \text{ } \epsilon$

6

$$\frac{(n^r-n-9)(n-1)^r}{(n^r+n+1)(r-n)^r} < 0$$

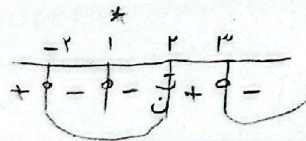


$$(n^r+n+1)(r-n)^r$$

$$(n+r)(n-1)^r < 0 \quad [-r, r) \cup [r, +\infty)$$

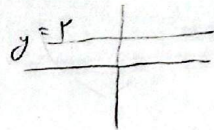
$$\Delta < \frac{(n^r+n+1)(r-n)^r}{(n+r)(n-1)^r}$$

$n = -r$ * $n = 1$ *
 $n = r$ * $n = r$



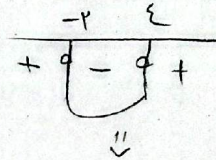
7

$$f(x) = \frac{rx^r-rm}{x^r+\epsilon}$$



$$\frac{rx^r-rm}{x^r+\epsilon} < r$$

$$\frac{rx^r-rm-rx^r-\epsilon}{x^r+\epsilon} < 0$$



$b-a =$

$r - (-r) = \underline{2r}$

$$\Delta < \frac{x^r-rm-\epsilon}{x^r+\epsilon} < 0$$

$$\frac{(x-r)(x+r)}{x^r+\epsilon} < 0$$

$x = r$ * $x = -r$

$(-r, r)$
 (a, b)

8

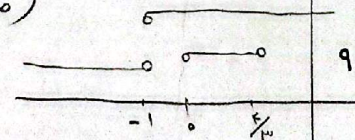
$$-1 < \frac{rx^r-\epsilon m}{x+1} < 0 \quad \Delta = 9 - \epsilon(r)$$

rx^r-rx+1

$$\frac{rx^r-rx}{x+1} + 1 \rightarrow \frac{rx^r-rx+x+1}{x+1} \rightarrow x = -1$$

$$\frac{-1}{x+1} \quad (-1, +\infty)$$

$n \downarrow$



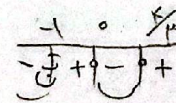
9

$$\frac{rx^r-rx}{x+1} < 0$$

$$\frac{x(rx-r)}{x+1} < 0$$

$x=0$ * $rx=r$ * $x = \frac{\epsilon}{r}$

$x = -1$



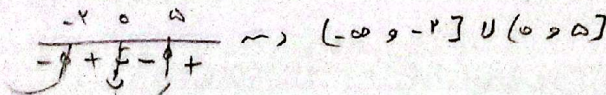
النسبة = $(0, \frac{\epsilon}{r})$

$$\frac{x^r-10}{x} \leq r$$

$$(x-0)(x+r)$$

$$\frac{x^r-rx-10}{x} \leq 0$$

$x = 0$
 $x = -r$
 $x = 0$



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