

مطلوب

محدوده تعریف

1) الف)  $y = x^r - a$

$$x^r = y + a$$

$$R_f = [-a, +\infty)$$

$$x = \pm \sqrt[r]{y+a}$$

$$y+a \geq 0 \quad y \geq -a$$

ب)  $y = x^r + 1$

$$y-1 = x^r$$

$$x = \sqrt[r]{y-1}$$

$$R_f = [1, +\infty)$$

2)  $y = x^r - rx + r$

$$x^r - rx + r + r$$

$$R_f = [r, +\infty)$$

$$y = (x-r)^r + r$$

$$y-r = (x-r)^r$$

$$\pm \sqrt[r]{y-r} = x-r$$

$$\pm \sqrt[r]{y-r} + r = x \quad y-r \geq 0 \quad y \geq r$$

ب)  $y = x^r - \frac{r}{f}x + \frac{r}{f}$

$$x^r - \frac{r}{f}x + \frac{r}{f} - \frac{r}{f} + 1$$

$$R_f = \left[ \frac{r}{f}, +\infty \right)$$

$$y = \left( x - \frac{r}{f} \right)^r + \frac{r}{f}$$

$$y - \frac{r}{f} = \left( x - \frac{r}{f} \right)^r$$

$$y - \frac{r}{f} \geq 0 \quad y \geq \frac{r}{f}$$

$$\pm \sqrt[r]{y - \frac{r}{f}} = x - \frac{r}{f}$$

$$\pm \sqrt[r]{y - \frac{r}{f}} + \frac{r}{f} = x$$

3) الف)  $y = \frac{x^r + r}{x^r x}$

$$y x^r - r y = x^r + r$$

$$R_f = (-\infty, -1/r] \cup (1, +\infty)$$

$$y x^r - x^r = r y + r$$

$$x^r (y-1) = r y + r$$

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

$$r y + r = 0 \quad y = -r \quad y = -\frac{r}{f}$$

$$x = \pm \sqrt[r]{\frac{r y + r}{y-1}}$$

$$\frac{-r}{f} \quad 1$$

$$3) \text{ ب) } y = \frac{r|m|+1}{|m|-r}$$

مساوی

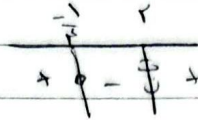
$$y|m| - ry = r|m| + 1$$

$$R_f = (-\infty, -\frac{1}{r}] \cup (r, +\infty)$$

$$y|m| - r|m| = ry + 1$$

$$|m|(y-r) = ry + 1$$

$$|m| = \frac{ry+1}{y-r}$$



$$4) y = \frac{1}{x^2 - 4x + r}$$

$$y(x^2 - 4x + r) = 1$$

$$y(x-r)^2 - 4y = 1$$

$$y((x-r)^2 - 4) = 1$$

$$(x-r)^2 - 4 = \frac{1}{y}$$

$$R_f = (0, \frac{1}{r}]$$

$$(x-r)^2 = \frac{1}{y} + 4$$

$$(x-r) = \pm \sqrt{\frac{1}{y} + 4}$$

$$x = \pm \sqrt{\frac{1}{y} + 4} + r$$

$$\frac{1}{y} + 4 > 0$$

$$\frac{1-4y}{y} > 0$$

$$y \neq 0$$

$$\frac{0}{-4+1} = \frac{1}{r}$$

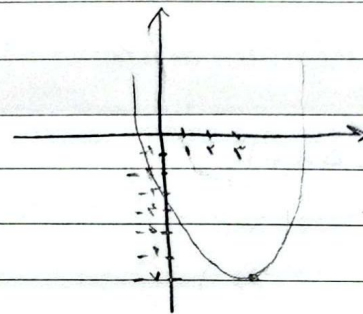
$$5) \text{ الف) } x^2 - 4x + r$$

$$x = \frac{-b}{2a} = \frac{4}{2} = 2$$

$$R_f = [-4, +\infty)$$

$$y = \frac{-\Delta}{4a} = \frac{-16}{4} = -4$$

$$\Delta = 16 - 4 \times 1 \times r = 16 - 4r$$



نقطه  
ضیق

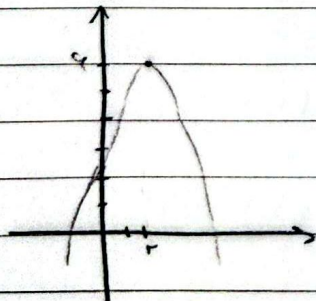
$$6) \text{ ب) } y = -x^2 + 4x + r$$

$$\frac{-b}{2a} = \frac{-4}{-2} = 2$$

$$\frac{-r}{-1} = 4$$

$$\Delta = 16 - 4 \times 1 \times r = 16 - 4r$$

$$R_f = (-\infty, 4]$$



$$4) \text{ الف) } \sqrt{2x^2 - 4x + 2} \rightarrow \min$$

بدراسة الجذر

$$m = \frac{-b}{2a} = \frac{4}{2} = 2$$

$$y = \frac{-\Delta}{2a} = \frac{-(4^2 - 4 \times 2 \times 1)}{2} = \frac{-20}{2} = -10$$

بدراسة الجذر في الفاصل

وفقاً لعمل دالة الجذر

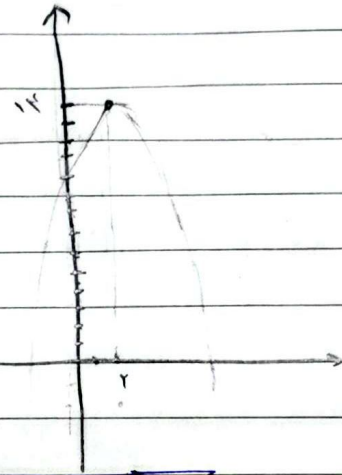
$$\sqrt{[-\infty, +\infty)} \rightarrow R_f = [0, +\infty)$$

$$4) \text{ ب) } \sqrt{-2x^2 + 4x + 1} \rightarrow \min$$

$$m = \frac{-b}{2a} = \frac{-4}{-2} = 2$$

$$y = \frac{-\Delta}{2a} = \frac{-(-4^2 - 2 \times 1 \times 1)}{-2} = \frac{-24}{-2} = 12$$

$$\sqrt{(-\infty, 12]} \rightarrow R_f = [0, 12]$$



$$5) \text{ الف) } y = \frac{x^2 + 2x + 1}{x^2 + 2x + 1}$$

$$R_f = R$$

$$\text{ب) } y = \sqrt{\frac{x^2 + 2x + 1}{x^2 + 2x + 1}}$$

$$\sqrt{R}$$

$$R_f = [0, +\infty)$$

$$6) \text{ الف) } y = \frac{x+1}{x-2} \quad R_f = R - \{2\}$$

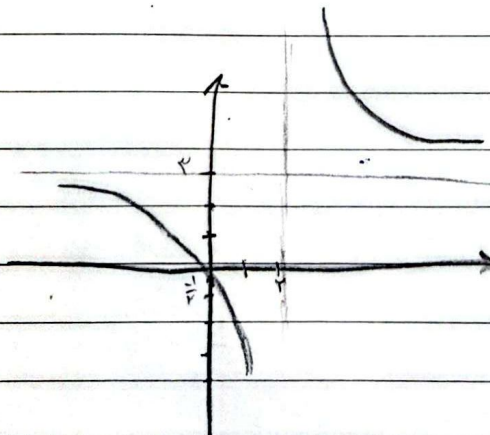
$$\text{ب) } y = \sqrt{\frac{x+1}{x+2}} \quad R_f = [0, 2) \cup (2, +\infty)$$

$$\sqrt{R - \{2\}}$$

$$9) \text{ الف) } y = \frac{x+1}{x-2}$$

$$x, 2$$

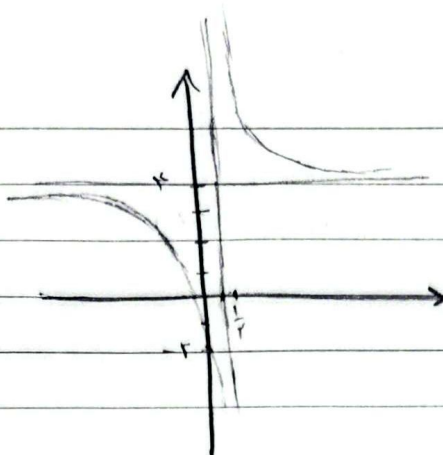
$$= \frac{1}{x}$$



$$1) \rightarrow \frac{f_{m-r}}{1-rn}$$

$$f = \frac{1}{r}$$

-r



دستگاه معادلات

$$1) y = \cos^n x + \frac{1}{\cos^n x}$$

$$x \in [r, +\infty)$$

$$R_f = [r, +\infty)$$

$$\rightarrow y = \sqrt[n]{\frac{x^r+1}{n}}$$

$$\rightarrow R_f = (-\infty, -r] \cup [r, +\infty)$$

$$\frac{n \cdot \frac{x^r}{n} + \frac{1}{n}}{n} = \frac{x^r + 1}{n}$$