

$$x^2 - a = y$$

$$x^2 = y + a$$

$$x = \pm \sqrt{y+a}$$

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

19, 175

نمره شما به دلیل ننوشتن اسم
صفر لحاظ می گردد.

$$y = x^2 + 1$$

$$x^2 = y - 1$$

$$x = \sqrt{y-1}$$

$$R_f = \mathbb{R}$$

2

$$y = x^2 - 4x + 4 \rightarrow y = x^2 - 4x + 4 + 2 \rightarrow y = (x-2)^2 + 2 \rightarrow y-2 = (x-2)^2 \rightarrow x-2 = \pm \sqrt{y-2} = x$$

$$R_f = [2, +\infty)$$

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

$$\frac{a}{2} \pm \sqrt{y + \frac{a^2}{4} - 1} = x$$

$$R_f = [-\frac{a^2}{4} + 1, +\infty)$$

2

$$y x^2 - 2y = x^2 + 2$$

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

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

$$x = \pm \sqrt{\frac{2y+2}{y-1}}$$

$$y \mid \begin{array}{c} -\frac{2}{1} \\ + \end{array} \begin{array}{c} -\frac{2}{1} \\ + \end{array}$$

$$R_f = (-\infty, -\frac{2}{1}] \cup (1, +\infty)$$

$$|x|y - 2y = 2|x| + 1$$

$$|x|(y-2) = 2y+1$$

$$|x| = \frac{2y+1}{y-2}$$

$$y \mid \begin{array}{c} -\frac{1}{2} \\ + \end{array} \begin{array}{c} -\frac{1}{2} \\ + \end{array}$$

$$R_f = (-\infty, -\frac{1}{2}] \cup (2, +\infty)$$

$$y = \frac{1}{x^2 - 4x} \rightarrow y x^2 - 4x y = 1 \rightarrow y x^2 - 4x y - 1 = 0$$

$$b^2 - 4ac \geq 0$$

$$16y^2 + 4y \geq 0$$

$$4y(4y+1) \geq 0$$

$$y \mid \begin{array}{c} -\frac{1}{4} \\ + \end{array} \begin{array}{c} 0 \\ + \end{array}$$

$$R_f = (-\infty, -\frac{1}{4}] \cup (0, +\infty)$$

2

$$R_f = \mathbb{R} - (-\frac{1}{4}, 0)$$

$$y = x^2 - 4x + 2$$

$$x_{\min} = \frac{-b}{2a} = 2$$

$$y_{\min} = -2$$

$$y = -x^2 + 4x + 2$$

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

$$y_{\max} = 6$$

$$R_f = [2, +\infty)$$

$$R_f = (-\infty, 6]$$

2

$$x_{\min} = \frac{-b}{2a} = \frac{-\frac{1}{2}}{1} = -\frac{1}{2}$$

$$y_{\min} = \frac{1}{4}$$

$$R_f = \sqrt{[-\frac{1}{2}, +\infty)}$$

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

$$x_{\max} = \frac{-b}{2a} = \frac{-\frac{1}{2}}{1} = -\frac{1}{2}$$

$$y_{\max} = \frac{1}{4}$$

$$R_f = \sqrt{[-\infty, +\infty]} = [0, \sqrt{1/4}]$$

✓

$$y = x^2 + 2x + 1$$

$$R_f = \mathbb{R}$$

✓

$$y = \sqrt{x^2 + 2x + 1}$$

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

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

$$ad \neq bc \quad c \neq 0$$

$$R_f = \mathbb{R} - \left\{\frac{a}{c}\right\} \rightarrow R_f = \mathbb{R} - \{2\}$$

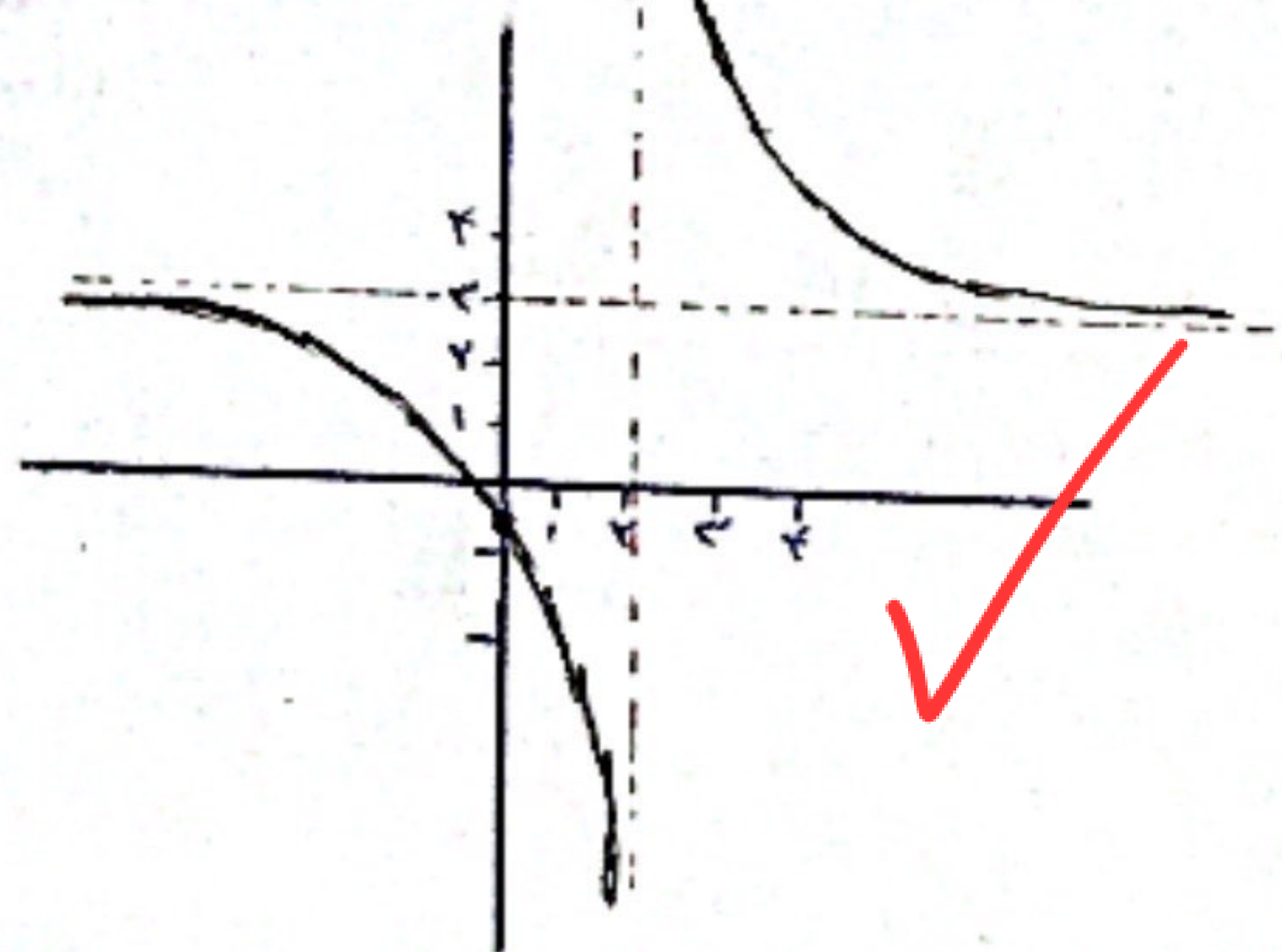
$$y = \sqrt{\frac{2x+1}{x+2}}$$

$$R_f = [0, +\infty) - \{2\}$$

✓

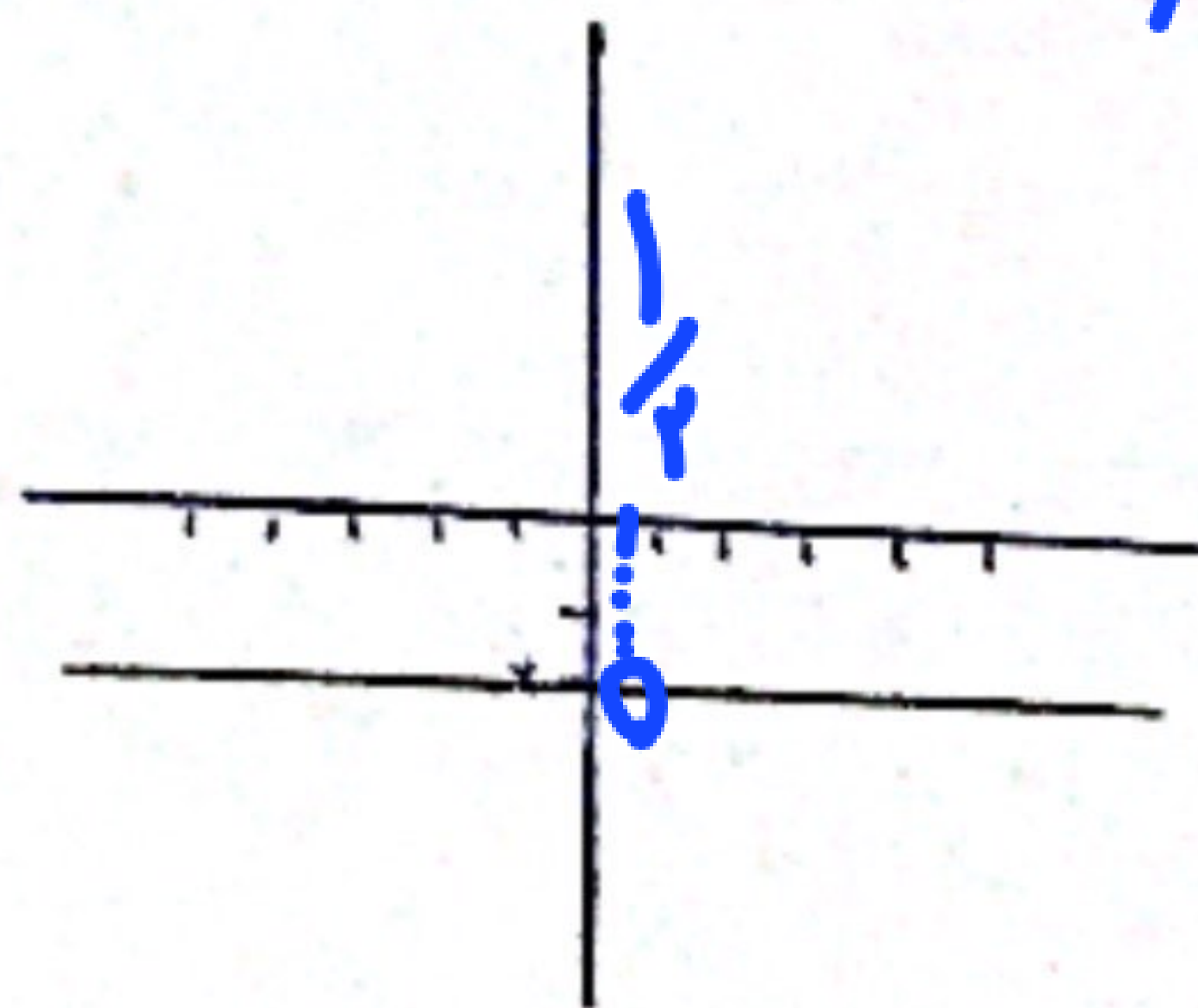
$$y = \frac{2x+1}{x-2}$$

مخالف فاصله از منحنی
مخالف افقی $y = \frac{a}{c}$



$$y = \frac{2x-2}{1-2x} \rightarrow y = -2$$

$$x \neq \frac{1}{2}$$



$$y = \cos^2 x + \frac{1}{\cos^2 x}$$

$$R_f = [2, +\infty)$$

چون هر دو می توانند مثبت باشند
 $a + \frac{1}{a} \rightarrow a > 0 \rightarrow [2, +\infty)$

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

$$R_f = (-\infty, \sqrt{2}] \cup [\sqrt{2}, +\infty)$$

✓

$$y = \sqrt{x + \frac{1}{x}}$$