

|                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                 |      |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|------|-----|---|-------|---|---|---|---|---|---|---|--|---|---|---|---|
| <p>الف</p> $D_f = R = \left[ \frac{1}{4}, \frac{1}{4} \right]$ $\frac{x+3}{x^2-x-1}$ <table> <tr> <td>-3</td> <td>-1</td> <td>-1/2</td> <td>1/2</td> </tr> <tr> <td>+</td> <td>-</td> <td>+</td> <td>-</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table> $D_f = R = \left[ -1, -\frac{1}{2}, \frac{1}{2} \right]$ | -3                                                                                                                                                                              | -1   | -1/2 | 1/2 | + | - | +                                                                                                                                                                                                                                                                      | -  | 0 | 0                                                                                                                                                                                                                                                                                                                   | 0 | 0  | <p>ب</p> $\frac{x+3}{x^2-x-1}$ <table> <tr> <td>-3</td> <td>-1</td> <td>-1/2</td> <td>1/2</td> </tr> <tr> <td>+</td> <td>-</td> <td>+</td> <td>-</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table> $D_f = R = \left[ -1, -\frac{1}{2}, \frac{1}{2} \right]$ | -3 | -1    | -1/2 | 1/2 | + | -     | + | - | 0 | 0 | 0 | 0 | 1 |  |   |   |   |   |
| -3                                                                                                                                                                                                                                                                                                                                         | -1                                                                                                                                                                              | -1/2 | 1/2  |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| +                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                                                               | +    | -    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| 0                                                                                                                                                                                                                                                                                                                                          | 0                                                                                                                                                                               | 0    | 0    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| -3                                                                                                                                                                                                                                                                                                                                         | -1                                                                                                                                                                              | -1/2 | 1/2  |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| +                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                                                               | +    | -    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| 0                                                                                                                                                                                                                                                                                                                                          | 0                                                                                                                                                                               | 0    | 0    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| <p>الف</p> $x^2 - 2x \geq 0$ $2x \leq 3$ $x \leq \frac{3}{2}$ $x - \sqrt{3-2x} \neq 0$ $x \neq \sqrt{3-2x}$ $x^2 \neq 3-2x$ $x^2 + 2x - 3 \neq 0$ $(x+3)(x-1) \neq 0$ $D_f = [x   x \in R, x \leq \frac{3}{2}, x \neq 1, x \neq -3]$                                                                                                       | <p>ب</p> $x - \sqrt{3-2x} \neq 0$ $x \neq \sqrt{3-2x}$ $x^2 \neq 3-2x$ $x^2 + 2x - 3 \neq 0$ $(x+3)(x-1) \neq 0$ $D_f = [x   x \in R, x \geq \frac{3}{2}, x \neq 1, x \neq -3]$ | 2    |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| <p>الف</p> $\frac{(x-3)(x-1)}{(x-1)(x^2+x+1)}$ <table> <tr> <td>-3</td> <td>-1</td> <td>0</td> </tr> <tr> <td>+</td> <td>-</td> <td>+</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> </table> $D_f = [3, +\infty)$                                                                                                                 | -3                                                                                                                                                                              | -1   | 0    | +   | - | + | 0                                                                                                                                                                                                                                                                      | 0  | 0 | <p>ب</p> $\frac{x^2-5x+3}{x^2-1}$ $x^2-1 \neq 0$ $(x-1)(x+1) \neq 0$ $D_f = R = [-1, 1]$                                                                                                                                                                                                                            | 3 |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| -3                                                                                                                                                                                                                                                                                                                                         | -1                                                                                                                                                                              | 0    |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| +                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                                                               | +    |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| 0                                                                                                                                                                                                                                                                                                                                          | 0                                                                                                                                                                               | 0    |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| <p>الف</p> $x^2 - 3x > 0$ $x(x-3) > 0$ <table> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>+</td> <td>-</td> </tr> <tr> <td>0</td> <td>0</td> </tr> </table> $D_f = (-\infty, 0) \cup (3, +\infty)$                                                                                                                                          | 0                                                                                                                                                                               | 3    | +    | -   | 0 | 0 | <p>ب</p> $ x-2  > 0$ $(x-2)(x+2) > 0$ <table> <tr> <td>-2</td> <td>2</td> </tr> <tr> <td>-</td> <td>+</td> </tr> <tr> <td>0</td> <td>0</td> </tr> </table> $ x-2  = 1$ $x-2 = 1 \Rightarrow x = 3$ $x-2 = -1 \Rightarrow x = 1$ $D_f = (-\infty, 1) \cup (3, +\infty)$ | -2 | 2 | -                                                                                                                                                                                                                                                                                                                   | + | 0  | 0                                                                                                                                                                                                                                                                                    | 4  |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| 0                                                                                                                                                                                                                                                                                                                                          | 3                                                                                                                                                                               |      |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| +                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                                                               |      |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| 0                                                                                                                                                                                                                                                                                                                                          | 0                                                                                                                                                                               |      |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| -2                                                                                                                                                                                                                                                                                                                                         | 2                                                                                                                                                                               |      |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| -                                                                                                                                                                                                                                                                                                                                          | +                                                                                                                                                                               |      |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| 0                                                                                                                                                                                                                                                                                                                                          | 0                                                                                                                                                                               |      |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| <p>الف</p> $y = \frac{x^2-x}{x^2+x} = \frac{x(x-1)}{x(x+1)}$ <table> <tr> <td>-1</td> <td>0</td> <td>1</td> </tr> <tr> <td>+</td> <td>-</td> <td>+</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> </table> $D_f = (-\infty, 1) \cup [1, +\infty)$                                                                                  | -1                                                                                                                                                                              | 0    | 1    | +   | - | + | 0                                                                                                                                                                                                                                                                      | 0  | 0 | <p>ب</p> <table> <tr> <td>x</td> <td>-1</td> <td>0</td> <td>1</td> </tr> <tr> <td>x^2-x</td> <td>+</td> <td>0</td> <td>-</td> </tr> <tr> <td>x^2+x</td> <td>+</td> <td>0</td> <td>+</td> </tr> <tr> <td></td> <td>+</td> <td>-</td> <td>+</td> </tr> <tr> <td></td> <td>0</td> <td>0</td> <td>0</td> </tr> </table> | x | -1 | 0                                                                                                                                                                                                                                                                                    | 1  | x^2-x | +    | 0   | - | x^2+x | + | 0 | + |   | + | - | + |  | 0 | 0 | 0 | 5 |
| -1                                                                                                                                                                                                                                                                                                                                         | 0                                                                                                                                                                               | 1    |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| +                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                                                               | +    |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| 0                                                                                                                                                                                                                                                                                                                                          | 0                                                                                                                                                                               | 0    |      |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| x                                                                                                                                                                                                                                                                                                                                          | -1                                                                                                                                                                              | 0    | 1    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| x^2-x                                                                                                                                                                                                                                                                                                                                      | +                                                                                                                                                                               | 0    | -    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
| x^2+x                                                                                                                                                                                                                                                                                                                                      | +                                                                                                                                                                               | 0    | +    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
|                                                                                                                                                                                                                                                                                                                                            | +                                                                                                                                                                               | -    | +    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |
|                                                                                                                                                                                                                                                                                                                                            | 0                                                                                                                                                                               | 0    | 0    |     |   |   |                                                                                                                                                                                                                                                                        |    |   |                                                                                                                                                                                                                                                                                                                     |   |    |                                                                                                                                                                                                                                                                                      |    |       |      |     |   |       |   |   |   |   |   |   |   |  |   |   |   |   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="margin-right: 20px;"> <math>\sqrt{x \cdot f(x)}</math><br/> <math>\xrightarrow{f(x)}</math><br/> <math>\xrightarrow{-\sqrt{x}}</math> </div> <div> <math>\xrightarrow{f(x)=1}</math> </div> </div> <div style="text-align: center; margin-bottom: 10px;"> <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">-2</td> <td style="padding: 0 10px;">-1</td> <td style="padding: 0 10px;">1</td> <td style="padding: 0 10px;">2</td> <td style="padding: 0 10px;">3</td> </tr> <tr> <td style="text-align: center;">-</td> <td style="text-align: center;">+</td> <td style="text-align: center;">-</td> <td style="text-align: center;">+</td> <td style="text-align: center;">-</td> </tr> <tr> <td style="text-align: center;">o</td> <td style="text-align: center;">o</td> <td style="text-align: center;">o</td> <td style="text-align: center;">o</td> <td style="text-align: center;">o</td> </tr> </table> </div> <p style="text-align: center;"><math>D_f = (-2, 1] \cup (2, 3)</math></p> | -2 | -1 | 1 | 2 | 3 | - | + | - | + | - | o | o | o | o | o | 6 |
| -2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -1 | 1  | 2 | 3 |   |   |   |   |   |   |   |   |   |   |   |   |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | +  | -  | + | - |   |   |   |   |   |   |   |   |   |   |   |   |
| o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | o  | o  | o | o |   |   |   |   |   |   |   |   |   |   |   |   |
| <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>الف</p> </div> <div style="text-align: center;"> <p>ب</p> </div> <div style="text-align: center;"> <p>ج</p> </div> <div style="text-align: center;"> <p>د</p> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 7  |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><math>f(x) = \sqrt{x(x^2-2)}</math></p> <p><math>x(x^2-2) \geq 0</math></p> <div style="text-align: center;"> <table> <tr><td>-</td><td>+</td><td>-</td><td>+</td></tr> <tr><td>o</td><td>o</td><td>o</td><td>o</td></tr> </table> </div> <p><math>[-\sqrt{2}, 0] \cup [\sqrt{2}, +\infty)</math></p> </div> <div style="width: 45%;"> <p><math>G(x) = \sqrt{x} \sqrt{x^2-2}</math></p> <p><math>x \geq 0</math>      <math>x^2-2 \geq 0</math></p> <div style="text-align: center;"> <table> <tr><td>-</td><td>+</td><td>+</td></tr> <tr><td>o</td><td>o</td><td>o</td></tr> </table> </div> <p><math>(-\infty, -\sqrt{2}] \cup [\sqrt{2}, +\infty) \rightarrow [\sqrt{2}, +\infty)</math></p> </div> </div> <p style="text-align: right;">جوابی نیست</p>                                                                                                                                                                                                                                                                         | -  | +  | - | + | o | o | o | o | - | + | + | o | o | o | 8 |   |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | +  | -  | + |   |   |   |   |   |   |   |   |   |   |   |   |   |
| o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | o  | o  | o |   |   |   |   |   |   |   |   |   |   |   |   |   |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | +  | +  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | o  | o  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><math>f(x) = [\sqrt{x}] - [\sqrt{x}]</math></p> <p><math>D_f = [0, +\infty)</math></p> </div> <div style="width: 45%;"> <p><math>G(x) = \sqrt{x} \cdot  x </math></p> <p><math>D_f = [0, +\infty)</math></p> </div> </div> <p style="text-align: right;">جوابی است</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 9  |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>الف</p> <p><math>f(x) = \sqrt{x x }</math></p> <p><math>D_f = \mathbb{R}^+</math></p> <p><math>G(x) = x</math></p> <p><math>D_f = \mathbb{R}</math></p> </div> <div style="width: 45%;"> <p>ب</p> <p><math>f(x) = \frac{x}{ x }</math></p> <p><math>D_f = \mathbb{R} - \{0\}</math></p> <p><math>G(x) = \frac{ x }{x}</math></p> <p><math>D_f = \mathbb{R} - \{0\}</math></p> </div> </div> <p style="text-align: right;">جوابی است</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 10 |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |