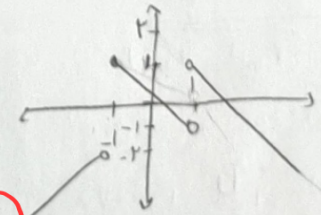


۲.

| نام و نام خانوادگی ..... کلاس ..... پاسخنامه تشریحی تکلیف شماره ۱                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| $A = \{(1, 2), (2, 3)\}$ $B = \{(2, 3)\}$<br>$A \times B = \{(1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)\}$<br>$B \times B = \{(2, 2), (2, 3), (3, 2), (3, 3)\}$<br>$A \times B - B^2 = \{(1, 2), (1, 3)\}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ۱ |
| <p>الف) <math>f(n) = \{(n, m^2), (n, 1), (n, m), (-n, m), (n, m+2), (m, n^2)\}</math></p> <p><math>m^2 = m+2 \rightarrow m^2 - m - 2 = 0</math> ✓</p> <p><math>(m-2)(m+1) = 0 \rightarrow m = 2 \text{ یا } -1</math></p> <p><math>m=2 \rightarrow X(2, 1) \times (2, 4) \rightarrow m = -1</math></p> <p><math>g(n) = \{(n^2, m^2), (n, 1), (m, n^2), (n, m+2), (-n, m), (-1, n^2)\}</math> ✓</p> <p><math>m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0</math></p> <p><math>m = 2 \rightarrow 2 \rightarrow 6 \times 6 \rightarrow (2, 1), (2, 4)</math></p> <p><math>m = -1 \rightarrow -1 \rightarrow 6 \times 6 \rightarrow (-1, 4), (-1, 3)</math></p> <p>برای هر مقدار <math>m</math> عبارت <math>m^2</math> مقابل <math>n^2</math> نیست</p> | ۲ |
| <p><math>f(n) = \begin{cases} n^2 - 1 &amp; ; n \leq 1 \\ an + b &amp; ; 1 \leq n \leq 2 \\ n^3 &amp; ; n \geq 2 \end{cases}</math></p> <p><math>a + b = 0</math><br/> <math>2a + b = 1 \rightarrow a = 1, b = -1</math></p> <p><math>a \times b = -1 \times 1 = -1</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ۳ |
| <p><math>f(n) = \begin{cases} 2n - 3 &amp; ; n \geq k \\ 4 - 2n &amp; ; n \leq k \end{cases}</math></p> <p><math>2k - 3 = 4 - 2k</math><br/> <math>4k = 7</math><br/> <math>k = \frac{7}{4}</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ۴ |
| <p><math>f(n) = \begin{cases} 5 - n + 2 &amp; ; n &gt; 1 \\ -n &amp; ; -1 \leq n &lt; 1 \\ n - 1 &amp; ; n &lt; -1 \end{cases}</math></p> <p><math>P_f = \{1\}</math> ✓    <math>R_f = (-\infty, 1]</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ۵ |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                            |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| <p>51) <math>xy^r + x^{r+1}</math></p> <p><math>xy^r = x_1^r - 1</math> , <math>xy^r = x_1^r - 1</math> <math>\leftarrow</math></p> <p><math>x_1 = x_1 \rightarrow xy^r = x_1^r</math></p> <p><math>y^r = y_1^r - y_1 = y_1</math> ✓ <math>\sqrt{\text{مستقیم}}</math></p>                                                                                                                                                                                                                 | <p><math>\rightarrow) n^r + ry^r - ry - 1 = n^r + ry^r - ry + 1 = 0</math></p> <p><math>(n^r - ry + 1) + (ry^r - ry + 1) = 0</math></p> <p><math>(n-1)^r + (y-1)^r = 0</math> <math>\sqrt{\text{مستقیم}}</math></p> <p><math>n-1=0 \rightarrow n=1</math></p> <p><math>ry - ry^r = 0 \rightarrow y = 1</math> ✓ <math>\sqrt{\text{مستقیم}}</math></p>                                                                      | 6 |
| <p>52) <math>x \sin y = y \sin x</math></p> <p><math>x=0</math> or <math>x \sin y = y \sin x</math> <math>\leftarrow</math></p> <p><math>x \sin y = y \sin x \rightarrow 0=0 \rightarrow</math> <math>\sqrt{\text{مستقیم}}</math></p>                                                                                                                                                                                                                                                      | <p><math>\rightarrow) \left( \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \right)</math></p> <p><math>\frac{x}{y} + \frac{y}{x} + 2 = 2 \rightarrow \frac{x^2 + y^2}{xy} = 2</math> ✓</p> <p><math>x^2 + y^2 = 2xy \rightarrow x^2 + y^2 - 2xy = 0</math></p> <p><math>(x-y)^2 = 0 \rightarrow x=y</math> <math>\sqrt{\text{مستقیم}}</math></p>                                                                             | 7 |
| <p>53) <math>y = \sqrt{\frac{x-1}{x-2}} + \sqrt{\frac{2-x}{x}}</math> ✓</p> <p><math>\frac{x-1}{x-2} \geq 0</math> <math>\rightarrow \frac{1}{1-\frac{1}{x}} \geq 0</math> <math>\leftarrow</math></p> <p><math>\frac{2-x}{x} \geq 0</math> <math>\rightarrow \frac{2}{x} \geq 1</math> <math>\leftarrow</math></p> <p><math>\textcircled{1} \cap \textcircled{2} = D_f = [0, 1]</math> <math>\leftarrow</math></p>                                                                        | <p><math>\rightarrow) \sqrt{x} + \sqrt{y-1} = \sqrt{2}</math></p> <p><math>\sqrt{x} \geq 0 \rightarrow x \geq 0</math> <math>\textcircled{1}</math> ✓</p> <p><math>\sqrt{y-1} = \sqrt{2} - \sqrt{x}</math></p> <p><math>\sqrt{2} - \sqrt{x} \geq 0 \rightarrow \sqrt{x} \leq \sqrt{2} \rightarrow x \leq 2</math> <math>\textcircled{2}</math></p> <p><math>\textcircled{1} \cap \textcircled{2} = D_f = [0, 2]</math></p> | 8 |
| <p>54) <math>y = \sqrt{n^2 - 4n + 4} \rightarrow n^2 - 4n + 4 \geq 0</math></p> <p><math>\sqrt{n^2 - 4n + 4} =  n-2 </math> <math>\rightarrow  n-2  \geq 0</math></p> <p><math>(n-2)(n-1) \geq 0</math> <math>\leftarrow</math></p> <p><math>14 &gt; 9 \rightarrow n &lt; \frac{14}{9}</math> <math>\textcircled{2}</math></p> <p><math>\textcircled{1} \cap \textcircled{2} = D_f = (-\infty, 1]</math> <math>\leftarrow</math></p>                                                       | <p><math>\rightarrow) y = \sqrt{\frac{n^2 - 4n + 4}{n^2 - 1 - n + 4}} \geq 0</math></p> <p><math>\frac{(n-2)(n-1)}{(n-1)(n-2)} \geq 0</math> <math>\leftarrow</math></p> <p><math>D_f = (-\infty, 1] \cup (2, 4] \cup (1, +\infty)</math></p>                                                                                                                                                                              | 9 |
| <p>55) <math>y = \sqrt{2n^2 - 3n + 1} \geq 0</math> ✓</p> <p><math>\sqrt{2n^2 - 3n + 1} \geq 0</math></p> <p><math>2n^2 - 3n + 1 \geq 0</math> <math>\rightarrow (2n-1)(n-1) \geq 0</math></p> <p><math>n = \frac{1}{2}</math> , <math>\frac{1}{2} &gt; 1</math> <math>\textcircled{1}</math> <math>\rightarrow 2n^2 - 3n + 1 &lt; 0</math></p> <p><math>2n^2 - 3n + 1 = (2n-1)(n-1) \rightarrow n = \frac{1}{2}</math> , <math>\frac{1}{2} &lt; 1</math> <math>\textcircled{2}</math></p> | <p><math>\rightarrow) y = \sqrt{\frac{2n^2 - 3n + 1}{2n^2 - 3n + 1}} \geq 0</math></p> <p><math>\frac{(2n-1)(n-1)}{(2n-1)(n-1)} \geq 0</math> <math>\leftarrow</math></p> <p><math>D_f = (-\infty, 1) \cup (1, \frac{1}{2}) \cup [\frac{1}{2}, +\infty)</math></p>                                                                                                                                                         |   |

$\textcircled{1} \cap \textcircled{2} \rightarrow D_f = (-\infty, 1) \cup [\frac{1}{2}, +\infty)$