

نام و نام خانوادگی کلاس باسندنامه تشریحی تکلیف شماره ۹

الف) $y = x^r - \Delta \Rightarrow x^r = y + \Delta \Rightarrow x = \sqrt[r]{y + \Delta} \Rightarrow y + \Delta \geq 0 \Rightarrow y \geq -\Delta \Rightarrow R(f) = [-\Delta, +\infty)$

ب) $y = x^r + 1 \Rightarrow x^r = y - 1 \Rightarrow x = \sqrt[r]{y - 1} \Rightarrow R(f) = [1, +\infty)$

الف) $y = x^r - \Delta x + \Delta = y = x^r - \Delta x + \Delta + r \Rightarrow (x - r)^r = y - r \Rightarrow x - r = \sqrt[r]{y - r} \Rightarrow x = \sqrt[r]{y - r} + r \Rightarrow y - r \geq 0 \Rightarrow y \geq r \Rightarrow R(f) = [r, +\infty)$

ب) $y = x^r - \Delta x + 1 \Rightarrow y = (x + r\Delta)^r - \Delta, r\Delta \Rightarrow (x + r\Delta)^r = y + \Delta, r\Delta \Rightarrow (x + r\Delta) = \sqrt[r]{y + \Delta, r\Delta} \Rightarrow y + \Delta, r\Delta \geq 0 \Rightarrow y \geq -\Delta, r\Delta \Rightarrow R(f) = [-\Delta, r\Delta, +\infty)$

الف) $y = \frac{x^r + r}{x^r - r} \Rightarrow y x^r - r y = x^r + r \Rightarrow y x^r - x^r = r y + r \Rightarrow x^r (y - 1) = r y + r \Rightarrow x^r = \frac{r y + r}{y - 1} \Rightarrow x = \sqrt[r]{\frac{r y + r}{y - 1}} \Rightarrow \frac{r y + r}{y - 1} \geq 0 \Rightarrow R(f) = (-\infty, -\frac{r}{r-1}] \cup (1, +\infty)$

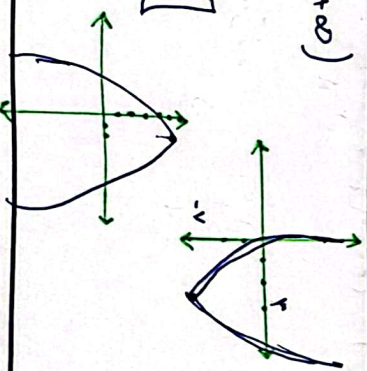
ب) $y = \frac{r|x| + 1}{|x| - r} \Rightarrow y|x| - r y = r|x| + 1 \Rightarrow y|x| - r|x| = r y + 1 \Rightarrow |x| (y - r) = r y + 1 \Rightarrow |x| = \frac{r y + 1}{y - r} \Rightarrow \frac{r y + 1}{y - r} \geq 0 \Rightarrow \frac{-\frac{1}{r}}{y - r} \geq 0 \Rightarrow R(f) = (-\infty, -\frac{1}{r}] \cup (r, +\infty)$

الف) $y = \frac{1}{x^r - \Delta x} = \frac{1}{(x - r)^r - \Delta} \Rightarrow D_f = (r, +\infty) \cup (-\infty, 0)$

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

الف) $y = x^r - \Delta x + r \rightarrow x = \frac{-b}{2a} = \frac{-r}{r} = -1 \Rightarrow R(f) = [-1, +\infty)$

ب) $y = -x^r + \Delta x + r \rightarrow x = \frac{-b}{2a} = \frac{-r}{-r} = r \Rightarrow R(f) = (-\infty, r]$



الف) $y = \sqrt{u^2 - 4u + 1} \rightarrow y \cdot \frac{-\Delta}{4a} = \frac{-(u^2 - 1)}{4} = -\frac{u}{4} \Rightarrow y \in [-\frac{u}{4}, +\infty)$
 $\Rightarrow R(f) = [0, +\infty)$

ب) $y = \sqrt{-u^2 + 4u + 1} \rightarrow y = \frac{-\Delta}{4a} = \frac{-(-14 - (4 \cdot 1))}{-4} = 14 \Rightarrow y \in (-\infty, 14]$

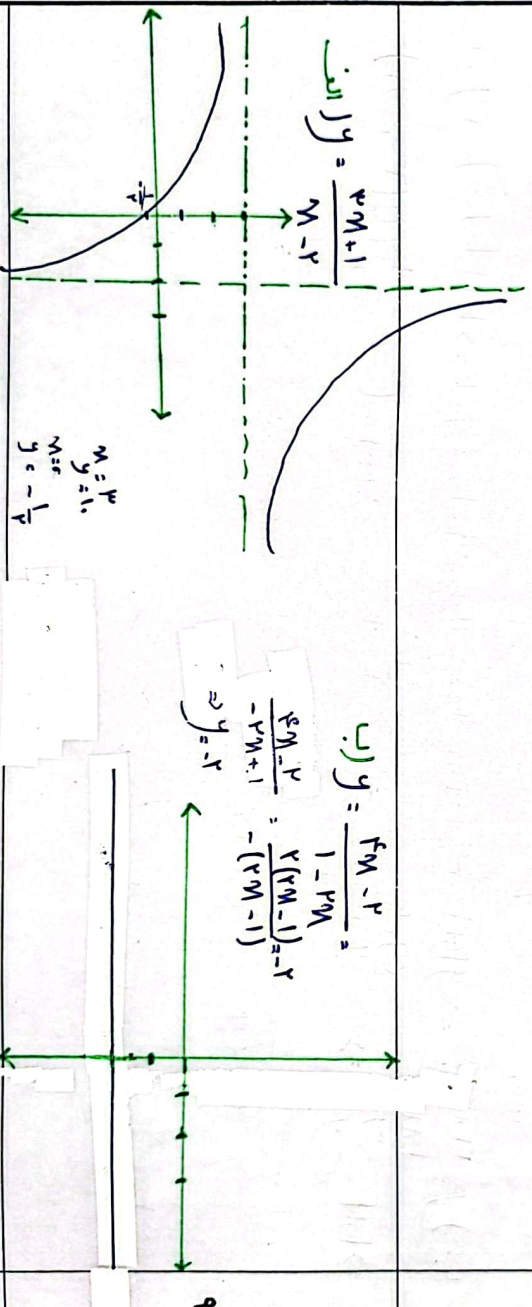
$R(f) = [0, 14]$

الف) $y = u + 3u^2 + 2u + 1 \quad R(g) = \mathbb{R}$

ب) $y = \sqrt{u^2 + 4u + 1} \Rightarrow \sqrt{14} \Rightarrow R(g) = [0, +\infty)$

الف) $y = \frac{3u+1}{u-2} \Rightarrow R(f) = \mathbb{R} - \{3\}$

ب) $y = \sqrt{\frac{4u+1}{u+2}} \Rightarrow \sqrt{14 - \{4\}} \Rightarrow R(f) = [0, +\infty) - \{2\}$



الف) $y = \cos^2 u + \frac{1}{\cos^2 u} \Rightarrow \{y \mid y \geq 2\} \Rightarrow R(f) = [2, +\infty)$

ب) $y = \int \frac{u^2}{u} = u \Rightarrow R(f) = (-\infty, +\infty) \cup [2, +\infty)$