

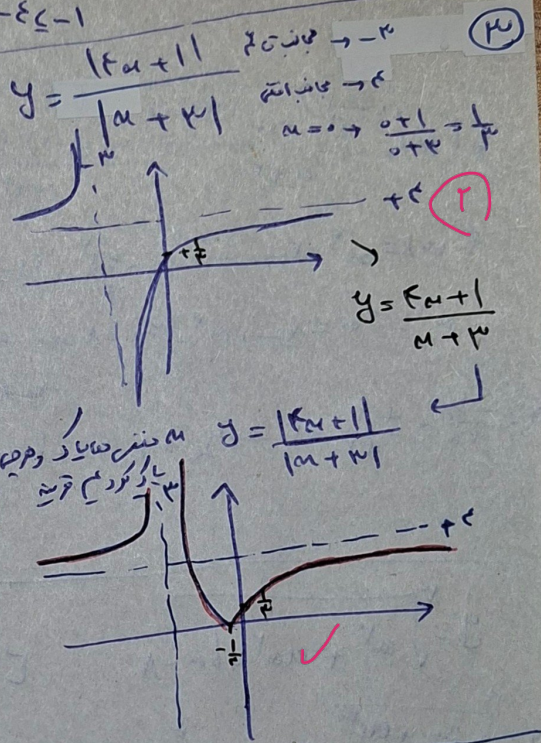
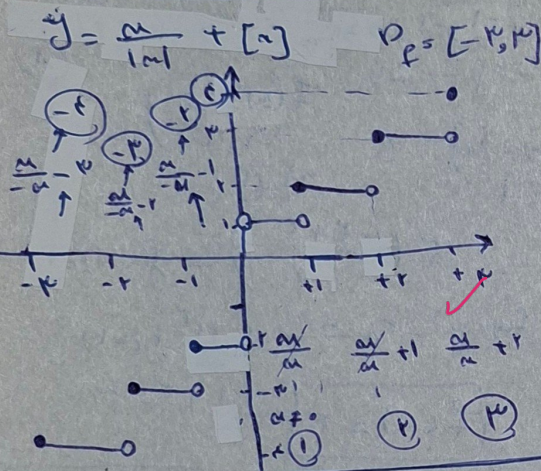
۱) بردارهای $\vec{a}$ و $\vec{b}$ (۲)

الف) $f(x) = 2 \sin^2(x + \frac{\pi}{6}) - 1$

ب) $g(x) = 3 \cos^2 x - 4$

$-1 \leq 2 \sin^2(x + \frac{\pi}{6}) - 1 \leq 1$
 $\Rightarrow R_f = [-1, 1]$

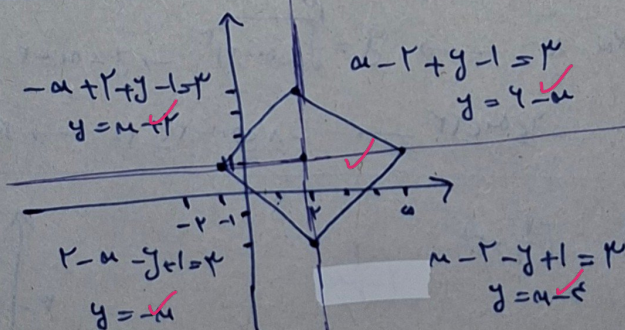
$-1 \leq \cos^2 x \leq 1$
 $-3 \leq 3 \cos^2 x \leq 3$
 $-4 \leq 3 \cos^2 x - 4 \leq -1$
 $\Rightarrow R_g = [-4, -1]$



$f(x+1) = 0 \Rightarrow 0 = |f(x+1)|$
 $f(x) = -1$
 $x = -\frac{1}{2}$

$y = \frac{|f(x+1)|}{|x+3|}$

$|x-2| + |y-1| = 3$
 $x=2, y=1$



الف) $f(x) = x + \frac{1}{x} + 2 \sqrt{x + \frac{1}{x}}$

ب) $y = (3 - \sin x)(1 + \sin x)$

$f(x) = (\sqrt{x + \frac{1}{x}})^2 + 2 \sqrt{x + \frac{1}{x}}$
 $\Rightarrow R_f = [2 + 2\sqrt{2}, +\infty)$

$\sin x \in [-1, 1]$
 $1 = \frac{1}{\sin x}$
 $R_f = [2, 4]$

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$f(x) = -\frac{1}{x}x + 10$ $R_f = \{1, 2, 3, 4, 5, 10\}$

$(-\frac{1}{x} \times 1 + 10) + (-\frac{1}{x} \times 2 + 10) + (-\frac{1}{x} \times 3 + 10) + \dots + (-\frac{1}{x} \times n + 10)$
 $-\frac{1}{x}(1+2+\dots+n) + n \times 10 = -\frac{n(n+1)}{2x} + 10n = 10n$
 $\frac{n(n+1)}{2x} = 10n$

$f(u) = \sqrt{au^r + bu + c}$ $D_f = [r, +\infty)$ $f(r) = 1$ $g(u) = \sqrt{bu^r + au - r}$ $D_g = [r, +\infty)$

if $\Delta \geq 0 \rightarrow \dots$ if $\Delta < 0 \rightarrow \dots$

$\Rightarrow a = \dots \rightarrow f(u) = \sqrt{bu + c}$

$f(r) = 1 \rightarrow 1 = \sqrt{rb + c}$

$0 = \sqrt{rb + c}$

$\begin{cases} rb + c = 0 \\ rb + c = 1 \end{cases}$

$b = 1 \rightarrow c = -1$

$g(u) = \sqrt{au^r + r}$

$a_3 = -\frac{b}{r} = 0$

$g_5 = r$

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

$f(u) = \frac{u^r - r}{u + r} = \frac{u(u-r)(u+r)}{u+r} = u(u-r)$

$R = \{a, b\} \rightarrow \dots$

$f\left(\frac{a+b}{rc}\right) = ?$

$f(u) = u^r - ru \xrightarrow{a=-r} (-r)^r - r(-r) = 1$

$[r, +\infty) - \{1\} \rightarrow \dots$

$\hookrightarrow c = -1$

$u^r - ru = 1 \rightarrow u^r - ru - 1 = 0 \rightarrow (u-r)(u+r) = 0$

$f\left(\frac{-r+r}{-r}\right) = f(-1) = ?$

$a_3 = -\frac{b}{rc} = \frac{+r}{+r} = 1 \rightarrow g_5 = 1 - r = -1 \rightarrow D_g = [-1, +\infty) - \{1\}$

$f(u) = u^r - ru \xrightarrow{a=-1} (-1)^r - r(-1) = 1 + r = r$

$f(-1) = r$

$y = \sqrt[r]{au^r + au^r + bu - 1}$

$[a, b]$

D_f

$\dots \rightarrow \dots$

$y = \sqrt[r]{(a-r)^r} \rightarrow a^r = -1 \rightarrow a = -r$

$(a-r)^r = a^r - 4a^r + 14a - 1 \rightarrow y = \sqrt[r]{(a-r)^r} \rightarrow y = a - r$

$a = -4 \quad b = 14$

$-4 \leq a \leq 14 \rightarrow -1 \leq a - r \leq 1 \rightarrow D_f = [-1, 1]$

$y = [a] + [a + \frac{1}{r}] \quad [\frac{1}{r}, r]$

$\frac{1}{r} \leq a < 1 \rightarrow 0 + 1 = 1$

$1 \leq a < \frac{r}{r} \rightarrow 1 + 1 = 2$

$\frac{r}{r} \leq a < r \rightarrow 1 + r = r$

$[1, r]$

