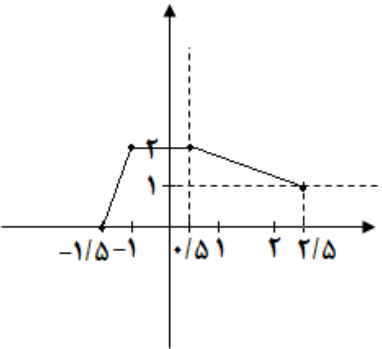
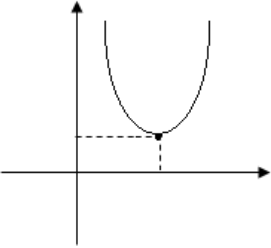
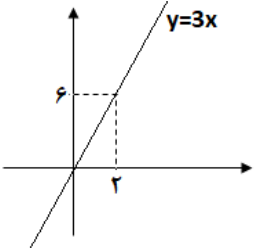
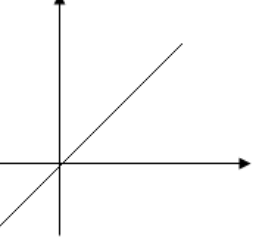
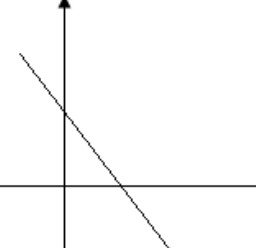
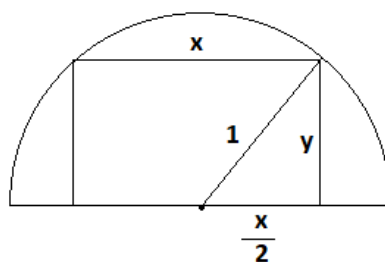
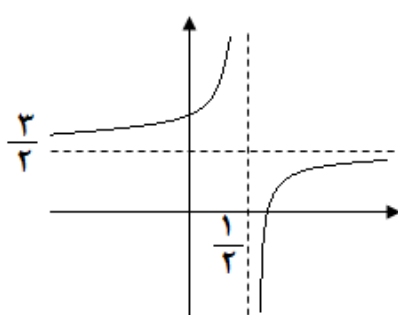


پاسخ سؤالات

۱	الف) درست ب) نادرست ج) درست د) نادرست	هر مورد (۰/۲۵)
۲	الف) $4 + \sqrt{2}, \pi$ ب) -۱ ج) $[3, 7]$ د) هر مورد (۰/۲۵)	
۳	$D_g = [-1/5, 2/5]$ (۰/۵) $R_g = [0, 2]$ (۰/۵)  (رسم شکل ۰/۵)	
۴	مثال صفحه ۴۰ کتاب	
	$\sin x + \cos x = 1$ $\sqrt{2} \sin(x + \frac{\pi}{4}) = 1 \rightarrow \sin(x + \frac{\pi}{4}) = \frac{1}{\sqrt{2}}$ (۰/۲۵), (۰/۲۵) $x + \frac{\pi}{4} = 2k\pi + \frac{\pi}{4} \rightarrow x = 2k\pi$ (۰/۵) $x + \frac{\pi}{4} = 2k\pi + \pi - \frac{\pi}{4} \rightarrow x = 2k\pi + \frac{\pi}{2}$ (۰/۵)	
۵	$n=0$ (۰/۲۵) $\frac{a}{2} = 2 \rightarrow a = 4$ (۰/۲۵)	
۶	الف) $\lim_{x \rightarrow -\infty} \frac{x + x }{x} = \lim_{x \rightarrow -\infty} \frac{x - x}{x} = \lim_{x \rightarrow -\infty} \frac{-2x}{x} = -2$ (۰/۲۵) ب) $\lim_{x \rightarrow -\infty} \frac{\frac{\pi}{2} + 1}{x} = 0$ (۰/۲۵)	
۷	مجانِب افقی $y = \lim_{x \rightarrow +\infty} \frac{ax^2 + x}{bx^2 + bx + 4} = \frac{a}{b} = 3 \Rightarrow a = 3b$ (۰/۲۵) مجانِب قائم $b(1)^2 + b(1) + 4 = 0 \rightarrow 2b = -4 \rightarrow b = -2$ $\Rightarrow a = 3(-2) = -6$ (۰/۲۵)	
۸	$f'_+(1) = \lim_{x \rightarrow 1^+} \frac{f(x) - f(1)}{x - 1} = \lim_{x \rightarrow 1^+} \frac{(x-1)[x] - 0}{x - 1} = \lim_{x \rightarrow 1^+} [x] = [1^+] = 1$ (۰/۵) $f'_-(1) = \lim_{x \rightarrow 1^-} \frac{f(x) - f(1)}{x - 1} = \lim_{x \rightarrow 1^-} \frac{(x-1)[x] - 0}{x - 1} = \lim_{x \rightarrow 1^-} [x] = [1^-] = 0$ (۰/۵) $f'_-(1) \neq f'_+(1)$ (۰/۵) در $x=1$ مشتق پذیر نیست	

$f'(x) = r(x^r + 1)(rx)\left(\sqrt{x} + \frac{1}{x}\right) + (x^r + 1)^r \left(\frac{1}{r\sqrt{x}} - \frac{1}{x^r}\right) \quad (0/5)$ $g'(x) = -\frac{1(x^r+1)-rx(x)}{(x^r+1)^r} \sin\left(\frac{x}{x^r+1}\right) \quad \text{نمره ۱}$	۹
$f'(x) = \frac{1}{r\sqrt{x}} \quad (0/25)$ $\frac{\Delta f}{\Delta x} = \frac{f(9)-f(4)}{9-4} = \frac{\sqrt{9}-\sqrt{4}}{5} = \frac{3-2}{5} = \frac{1}{5} \quad (0/5)$ $\frac{1}{r\sqrt{x}} = \frac{1}{5} \rightarrow x = \frac{25}{r} \quad (0/25)$	۱۰
الف)  ب)  پ)  ت)  هر مورد (۰/۵) نمره	۱۱
$\left(\frac{x}{r}\right)^r + y^r = 1 \rightarrow y = \sqrt[r]{1 - \frac{x^r}{r}} \quad (0/25)$ $S = xy = x \sqrt[r]{1 - \frac{x^r}{r}} \quad (0/25)$ $S'(x) = \sqrt[r]{1 - \frac{x^r}{r}} + x \left(\frac{-\frac{rx}{r}}{r \sqrt[r]{1 - \frac{x^r}{r}}} \right) = 0 \quad (0/5)$ $\sqrt[r]{1 - \frac{x^r}{r}} = \frac{\frac{x^r}{r}}{r \sqrt[r]{1 - \frac{x^r}{r}}} \Rightarrow 1 - \frac{x^r}{r} = \frac{x^r}{r}$ $\Rightarrow \frac{x^r}{r} = 1 \rightarrow x^r = r \rightarrow x = \sqrt[r]{r} \quad (0/25)$ $y = \sqrt[r]{1 - \frac{x^r}{r}} = \sqrt[r]{1 - \frac{r}{r}} = \sqrt[r]{\frac{1}{r}} = \frac{1}{\sqrt[r]{r}} \quad (0/25)$	۱۲
$(r, r) \rightarrow 1 + r a + b = r \quad (0/25)$ $f'(x) = rx^r + a \quad (0/25)$	۱۳



$f'(2) = 12 + a = 0 \rightarrow a = -12$ (0/25)																	
$8+2(-12)+b=3 \rightarrow b = -19$ (0/25)																	
$f'(x) = x^2 - 2x - 15 = 0 \rightarrow x = -3$ (0/25)	۱۴																
$X=0 \notin [-4.3]$																	
$f(-3)=\frac{1}{3}(-3)^3 - (-3)^2 - 15(-3) = 27$																	
$f(-4)=\frac{1}{3}(-64) - (-16) - 15(-4) = \frac{68}{3}$																	
$f(3)=\frac{1}{3}(27) - 9 - 45 = -45$																	
(0/25) مختصات ماکزیمم مطلق (27 و -3) (0/25) مختصات مینیمم مطلق (-45 و 3)																	
$f'(x) = x^2 + 3x^2 + 6ax$ (0/25)	۱۵																
$f''(x) = 3x^2 + 6vx + 6a$ (0/25)																	
$f''(1) = 3 + 6 + 6a = 0 \rightarrow a = \frac{-9}{6}$ (0/25)																	
$f(x)=\frac{3x-2}{2x-1}$	۱۶																
$D_f = R - \{\frac{1}{2}\}$																	
$y = \lim_{x \rightarrow \pm\infty} \frac{3x-2}{2x-1} = \frac{3}{2}$ مجانب افقی																	
$2x-1=0 \rightarrow x = \frac{1}{2}$ مجانب قائم (0/5) نمره																	
$f'(x) = \frac{1}{(2x-1)^2} > 0$																	
$f''(x) = \frac{-4}{(2x-1)^3}$																	
																	
رسم شکل (0/5)																	
<table><tr><td>x</td><td>$-\infty$</td><td>$\frac{1}{2}$</td><td>$+\infty$</td></tr><tr><td>y'</td><td>+</td><td></td><td>+</td></tr><tr><td>y''</td><td>+</td><td></td><td>-</td></tr><tr><td>y</td><td>$\frac{3}{2}$</td><td>$\nearrow +\infty$</td><td>$-\infty \searrow \frac{3}{2}$</td></tr></table>	x	$-\infty$	$\frac{1}{2}$	$+\infty$	y'	+		+	y''	+		-	y	$\frac{3}{2}$	$\nearrow +\infty$	$-\infty \searrow \frac{3}{2}$	
x	$-\infty$	$\frac{1}{2}$	$+\infty$														
y'	+		+														
y''	+		-														
y	$\frac{3}{2}$	$\nearrow +\infty$	$-\infty \searrow \frac{3}{2}$														
جدول (0/5) نمره																	