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1 - a) $F(x) = (3x-5)$

$u = 3x-5$
$u' = u^4$
$u' = 4u^3$

$g(x) = 3x-5$
$g'(x) = 3$

$f'(x) = 4u^3 \cdot 3$
$f'(x) = 12(3x-5)^3$ //

b) $= (2x+1)^{1/5}$

$u = 2x+1$
$u' = u^{\frac{1}{5}}$
$u' = \frac{1}{5} u^{-\frac{4}{5}}$
$u' = \frac{1}{5\sqrt[5]{u^4}}$

$g(x) = 2x+1$
$g'(x) = 2$

$f'(x) = \frac{1}{5\sqrt[5]{u^4}} \cdot 2$

$f'(x) = \frac{2}{5\sqrt[5]{(2x+1)^4}}$

c) $\sqrt[4]{(x^3-7x)} = (x^3-7x)^{1/4}$

$u = x^3-7x$
$u' = u^{\frac{1}{4}}$
$u' = \frac{1}{4\sqrt[4]{u^3}}$

$g(x) = x^3-7x$
$g'(x) = 3x^2-7$

$f'(x) = \frac{1}{4\sqrt[4]{u^3}} \cdot 3x^2-7$

$f'(x) = \frac{3x^2-7}{4\sqrt[4]{(x^3-7x)^3}}$

d) $\frac{2}{\sqrt[3]{(x^2+1)}}$

$u = x^2+1$
$u' = \frac{2}{\sqrt[3]{u}} = 2 \cdot u^{-\frac{1}{3}}$
$u' = 2 \cdot \left(-\frac{1}{3}\right) u^{-\frac{4}{3}} = \frac{-2}{3\sqrt[3]{u^4}}$

$g(x) = x^2+1$
$g'(x) = 2x$

$f'(x) \frac{-2}{3\sqrt[3]{u^4}} \cdot 2x$

$f'(x) = \frac{-4x}{3\sqrt[3]{(x^2+1)^4}}$

e) e^{2x+1}

$u = 2x+1$
$u' = e^{u}$
$u' = e^{u}$

$g(x) = 2x+1$
$g'(x) = 2$

$f'(x) = e^{u} \cdot 2$
$f'(x) = 2e^{2x+1}$

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f) $\cos^2 x + \cos(2x)$

$u = \cos x$
$u' = u^2$
$u' = 2u$

$g'(x) = \cos x$
$g'(x) = -\operatorname{sen} x$

$u = 2x$
$u' = \cos u$
$u' = -\operatorname{sen} u$

$g(x) = 2x$
$g'(x) = 2$

$(2u \cdot -\operatorname{sen} x) + (-\operatorname{sen} u \cdot 2)$
$f'(x) = -2u \operatorname{sen} x - 2 \operatorname{sen} u$
$f'(x) = -2(\cos x \operatorname{sen} x + \operatorname{sen}(2x))$ //

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g) $\ln(x^2 - 6x + 8)$

$g = (x^2 - 6x + 8)$
$g' = 2x - 6$

$u = x^2 - 6x + 8$
$u' = \ln u$
$u' = \frac{1}{u}$

$f'(x) = \frac{1}{u} \cdot 2x - 6$

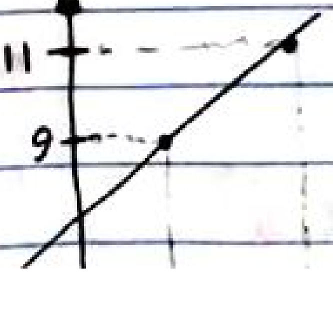
$f'(x) = \dfrac{2x-6}{x^2-6x+8}$

2- a) $a(t) = (T-5, T+3)$

$x = T - 5 \rightarrow x + 5 = T$
$y = T + 3 \rightarrow y - 3 = T$

$x + 5 = y - 3$
$y = x + 5 + 3 \rightarrow \boxed{y = x + 8}$

$x = 1, y = 1 + 8 \quad \propto (1, 9)$
$x = 3, y = 3 + 8 \quad \propto (3, 11)$



b) $\alpha(t) = (t-2, t^2)$

$x = t - 2 \rightarrow x+2 = t$ | $x+2 = \sqrt{y}$ | $x^2+2x\cdot 2+2^2 = y$

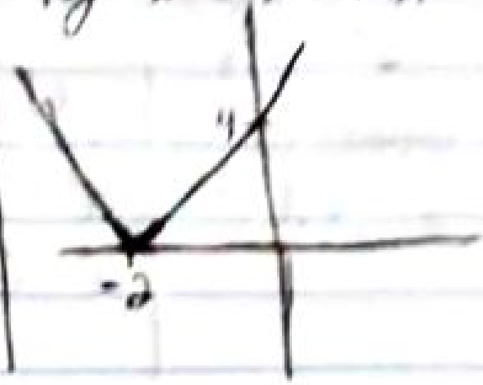
$y = t^2 \rightarrow \sqrt{y} = t$ | $(x+2)^2 = (\sqrt{y})^2$ | $y = x^2+4x+4$ //

$\Delta = b^2 - 4.a.c$ | $x_v = \frac{-b}{2.a} = \frac{-4}{2} = \boxed{-2}$

$\Delta = 4^2 - 4.1.4$

$\Delta = 16 - 16$

$\Delta = 0$



3-) Se $F(x,y) = x^3 - 3y^2 + xy$, determine $F_x(2,1)$ e $F_y(1,2)$

$F_x(2,1)$

$F_x(x,y) = x^3 - 3y^2 + xy$

$F_x' = 3x^2 + y$

$F_x'(2,1) = 3.2^2 + 1$

$F_x(2,1) = \boxed{13}$

$F_y = (1,2)$

$F_y(x,y) = x^3 - 3y^2 + xy$

$F_y'(x,y) = -6y + x$

$F_y'(1,2) = -6.2 + 1$

$F_y'(1,2) = \boxed{-11}$

4-a) $F(x,y,z) = 2x^3y + xy^3 - 3xz$

$F_x'(x,y,z) = 6x^2y + y^3 - 3z$

$F_y'(x,y,z) = 2x^3 + 3xy^2$

$F_z'(x,y,z) = -3x$

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b) $F(x,y) = x^4 + 6y^2 - x^3y^3$

$F_x'(x,y) = 4x^3 - 3x^2y^3$

$F_y'(x,y) = 12y - 3x^3y^2$

5-) Se $F(x,y) = x^3 \cdot \text{Sen}(xy^2)$ encontre $F_x(x,y)$ $F_y(x,y)$

$F_x(x,y)$ $u = xy^2$

1° parte	2° parte		1° Parte
$g(x) = x^3$	$u' = \text{Sen}\, u$	$I = xy^2$	$F(x) = 3x^2 \cdot \text{Sen}(xy^2)$
$g'(x) = 3x^2$	$u' = \text{Cos}\, u$	$I'x = y^2$	+ 2° Parte
	$u' = \text{Cos}(xy^2)$		$F(x) = x^3 \cdot y^2 \text{Cos}(xy^2)$

$$F(x) = 3x^2 \cdot \text{Sen}(xy^2) + x^3 \cdot y^2 \text{Cos}(xy^2)$$

$$F(x) = x^2\left(3\,\text{Sen}(xy^2) + x y^2 \text{Cos}(xy^2)\right)$$

$F_y(x,y)$ $u = xy^2$

1° part	2° Parte		1° parte
$g(x) = x^3$	$u' = \text{Sen}\, u$	$I = xy^2$	$F(y) = 0 \cdot \text{Sen}(xy^2)$
$g'y = 0$	$u' = \text{Cos}\, u$	$I'y = 2xy$	+ 2° parte
	$u' = \text{Cos}(xy^2)$		$2xy\,\text{Cos}(xy^2)$

$$F(y) = \cancel{0 \cdot \text{Sen}}(xy^2) + 2xy\,\text{Cos}(xy^2) \cdot x^3$$

$$F(y) = 2x^4 y\,\text{Cos}(xy^2)$$