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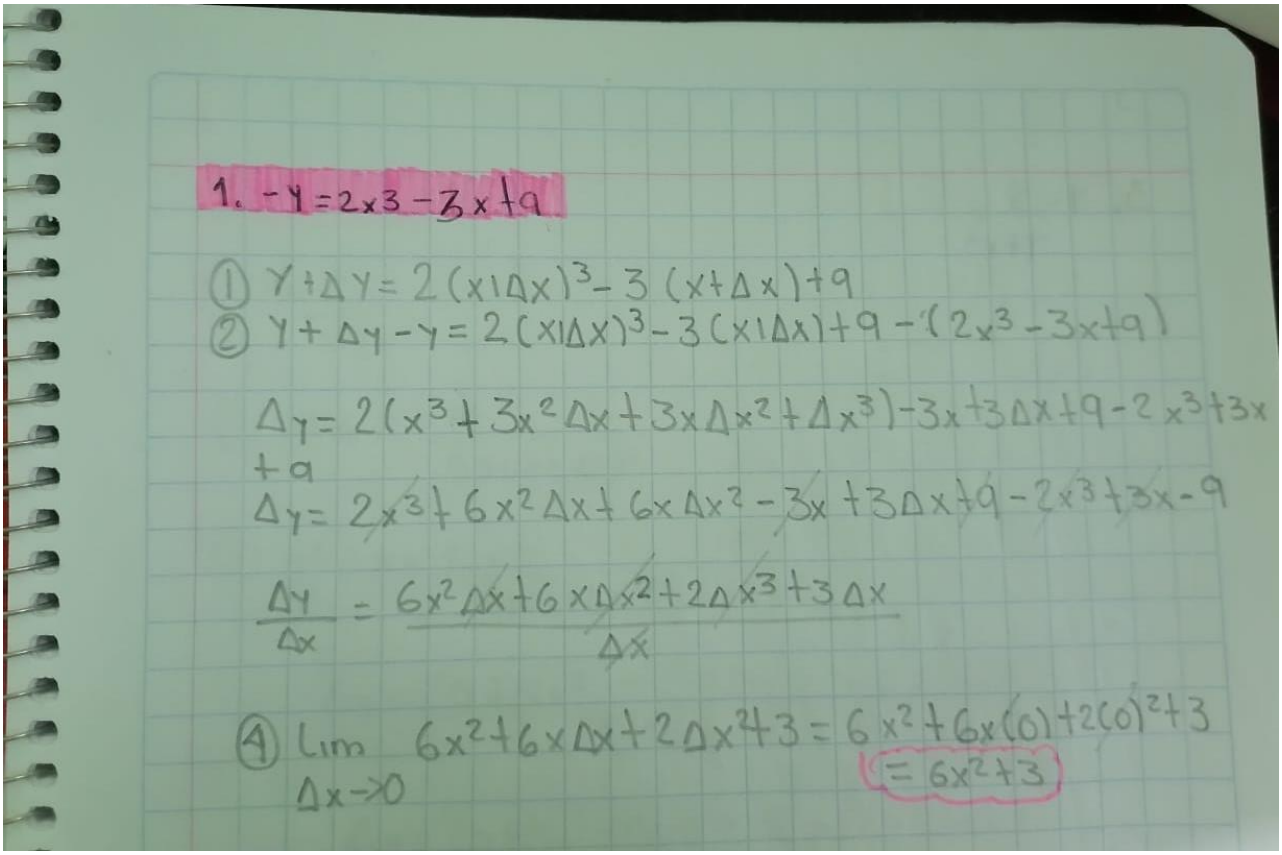
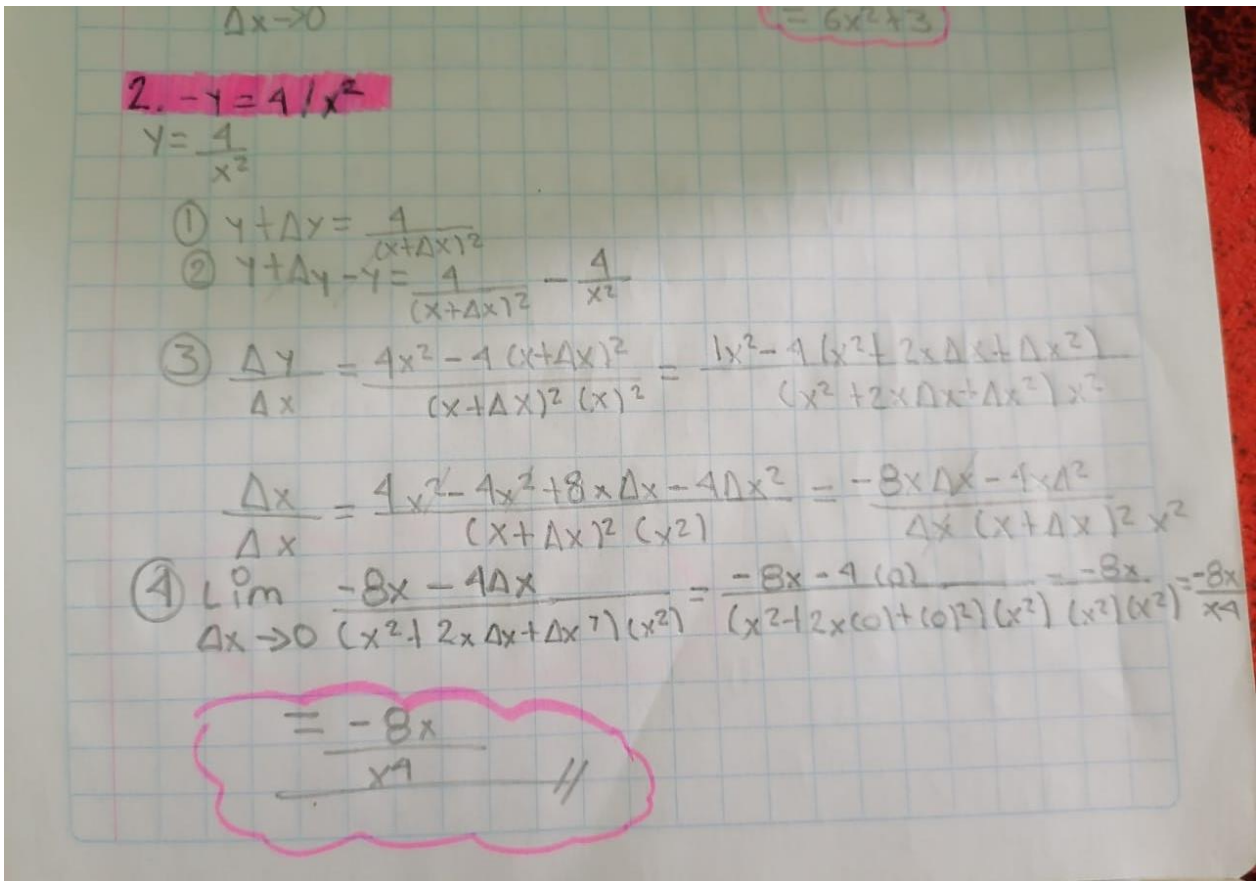
INSTRUCCIONES: Resuelve de forma clara y correcta las siguientes derivadas, aplicando el método general (método de los cuatro pasos)

NOTA: LOS NUMEROS DESPUES DE LAS VARIABLES Y LOS PARENTESIS SON EXPONENTES

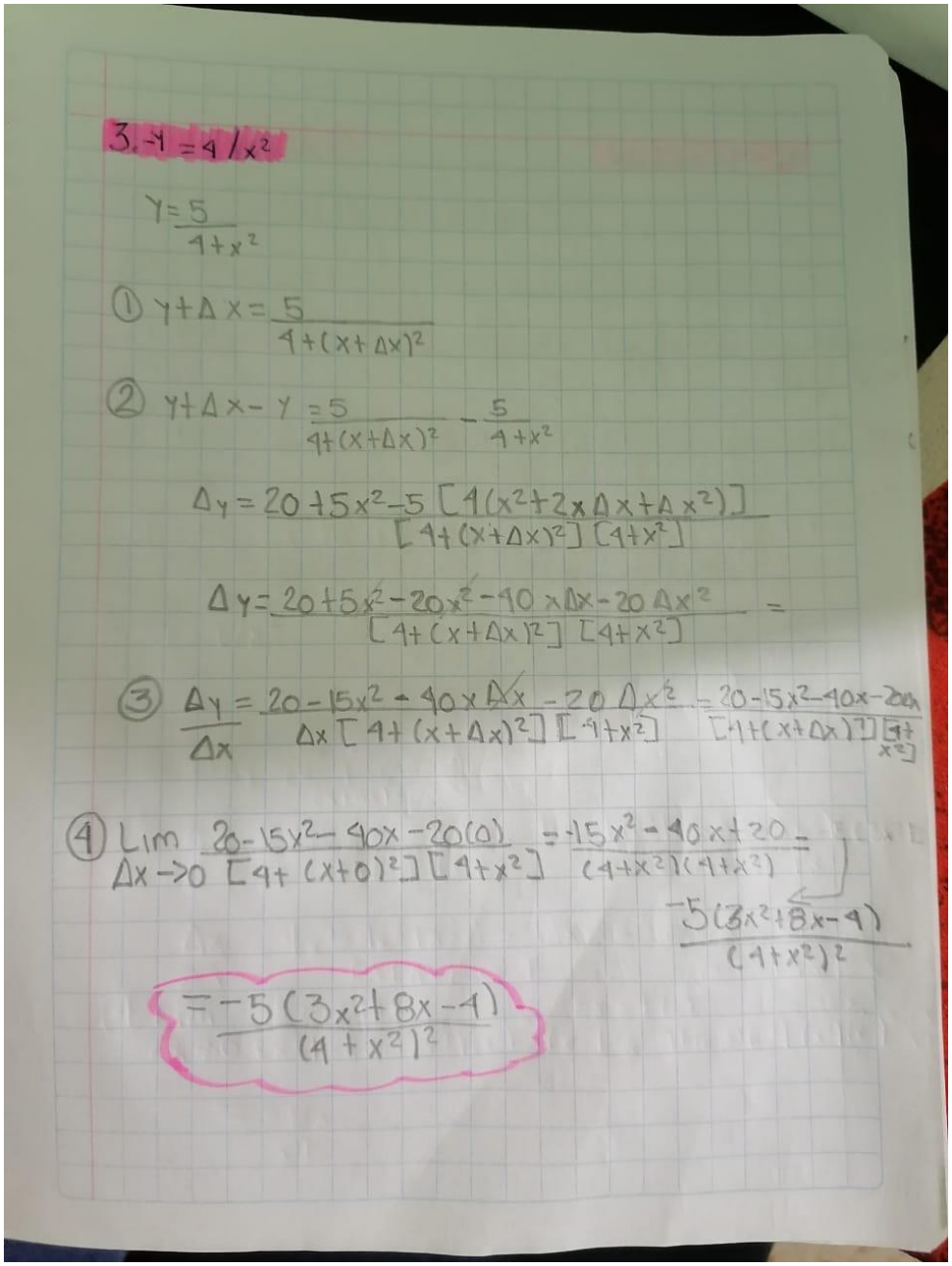
1.- Y = 2X3 – 3X + 9



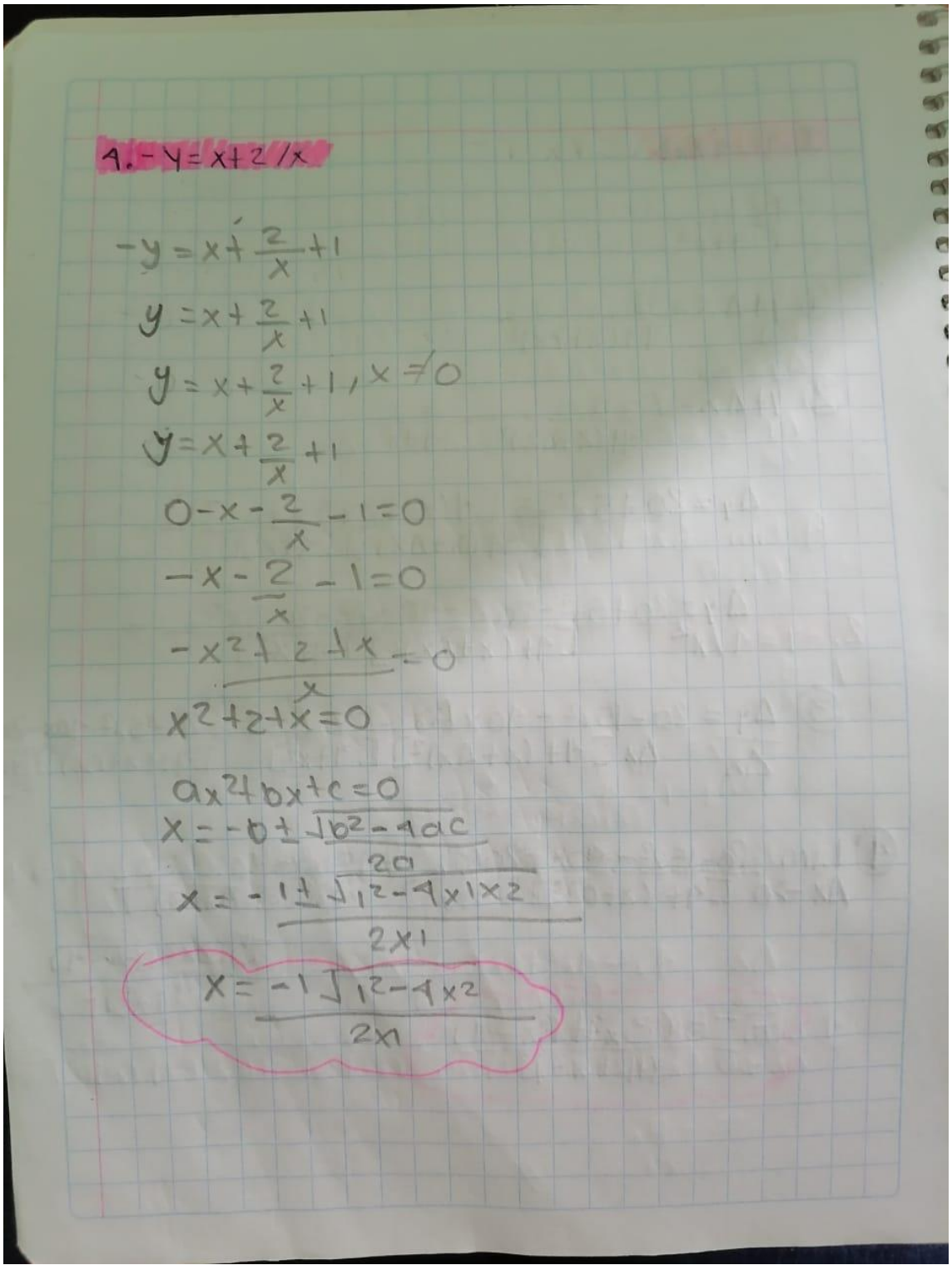
2.- Y = 4 / X2


Δx→0
= 6x²+3
2. -Y=4/x²
Y= 4/x²
① y+Δy = 4/(x+Δx)²
② y+Δy-y = 4/(x+Δx)² - 4/x²
③ Δy/Δx = 4x² - 4(x+Δx)² / (x+Δx)²(x)² = 4x² - 4(x²+2xΔx+Δx²) / (x²+2xΔx+Δx²)x²
Δx/Δx = 4x² - 4x² + 8xΔx - 4Δx² / (x+Δx)²(x²) = -8xΔx - 4Δx² / Δx(x+Δx)²x²
④ lim Δx→0 -8x - 4Δx / (x²+2xΔx+Δx²)(x²) = -8x - 4(0) / (x²+2x(0)+(0)²)(x²)(x²) = -8x / x⁴
= -8x / x⁴ //

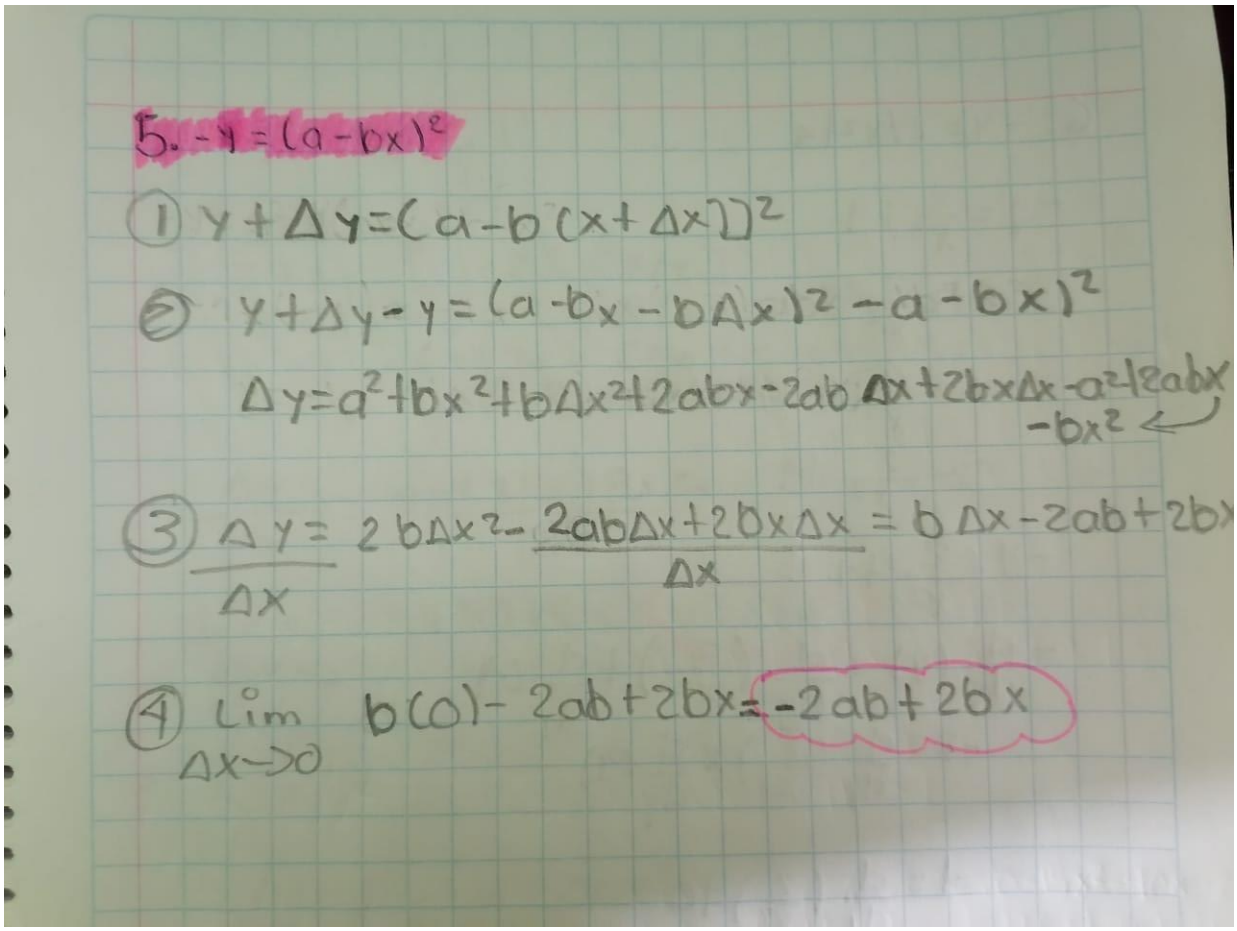
3.- Y = 5 / 4 + X2


3.-Y = 4 / x²
Y = 5 / 4+x²
① Y+Δx = 5 / 4+(x+Δx)²
② Y+Δx - Y = 5 / 4+(x+Δx)² - 5 / 4+x²
Δy = 20+5x²-5[4(x²+2xΔx+Δx²)] / [4+(x+Δx)²][4+x²]
Δy = 20+5x²-20x²-40xΔx-20Δx² / [4+(x+Δx)²][4+x²] =
③ Δy/Δx = 20-15x²-40xΔx-20Δx² / Δx[4+(x+Δx)²][4+x²] = 20-15x²-40x-20Δx / [4+(x+Δx)²][4+x²]
④ Lim Δx->0 20-15x²-40x-20(0) / [4+(x+0)²][4+x²] = -15x²-40x+20 / (4+x²)(4+x²) =
-5(3x²+8x-4) / (4+x²)²
Y' = -5(3x²+8x-4) / (4+x²)²

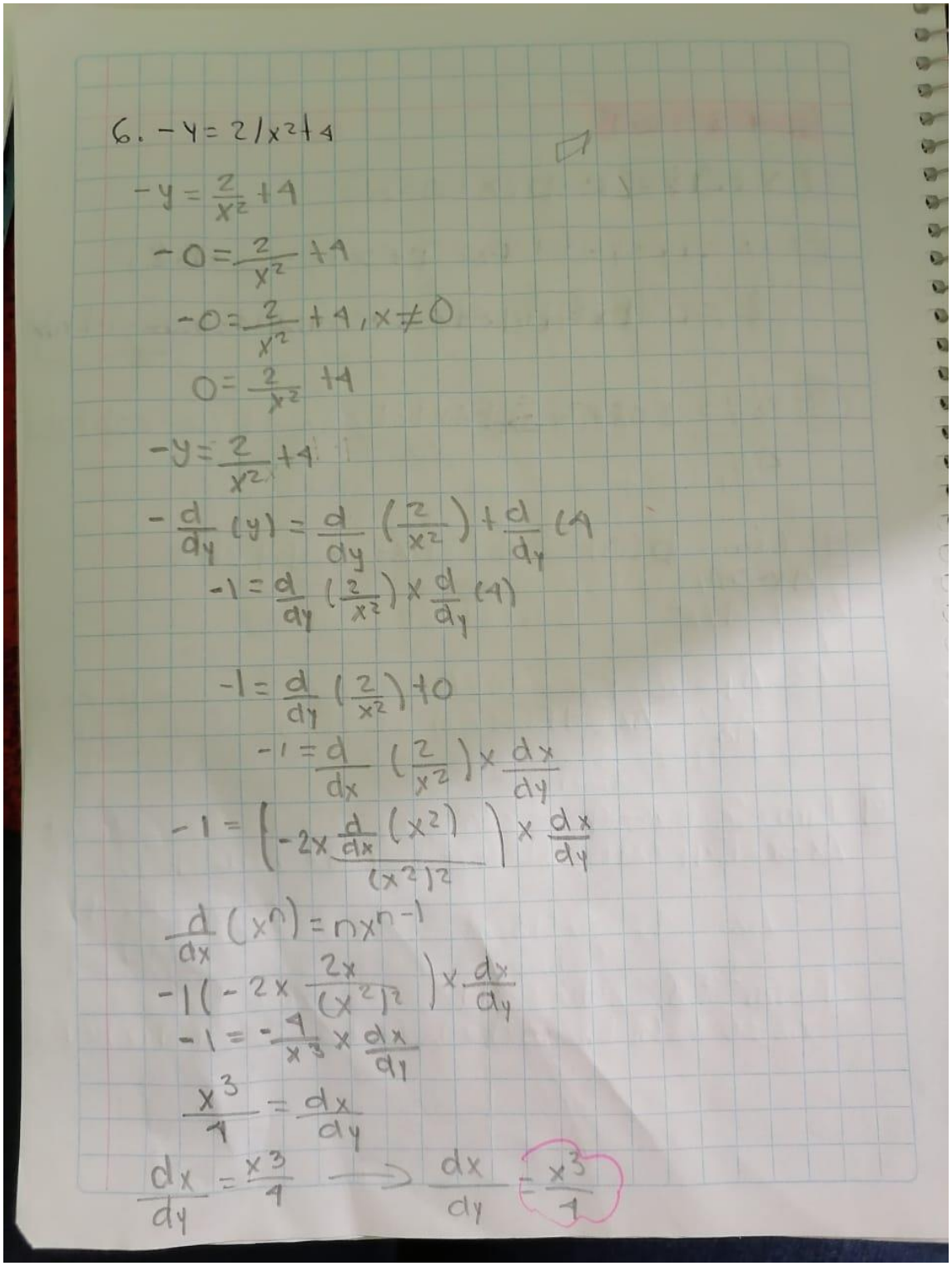
4.- Y = X + 2 / X


4.- Y = x + 2 / x
-y = x + 2/x + 1
y = x + 2/x + 1
y = x + 2/x + 1, x ≠ 0
y = x + 2/x + 1
0 - x - 2/x - 1 = 0
-x - 2/x - 1 = 0
-x² + 2 + x / x = 0
x² + 2 + x = 0
ax² + bx + c = 0
x = -b ± √b² - 4ac / 2a
x = -1 ± √1² - 4 x 1 x 2 / 2 x 1
x = -1 √1² - 4 x 2 / 2 x 1

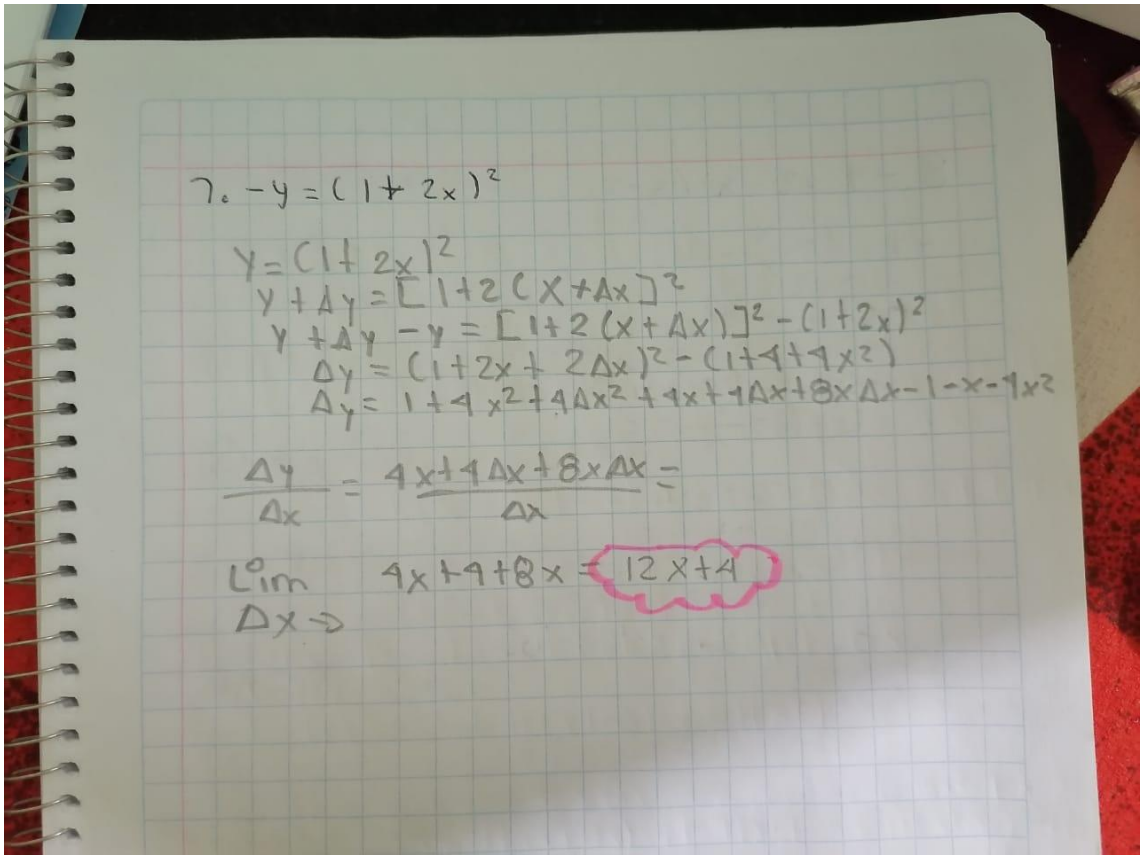
5.- Y = (a – bx)2


5.- y = (a - bx)²
① y + Δy = (a - b(x + Δx))²
② y + Δy - y = (a - bx - bΔx)² - a - bx)²
Δy = a² + bx² + bΔx² + 2abx - 2ab Δx + 2bxΔx - a² + 2abx
- bx²
③ Δy / Δx = 2bΔx² - 2abΔx + 2bxΔx / Δx = bΔx - 2ab + 2bx
④ lim Δx→0 b(0) - 2ab + 2bx = -2ab + 2bx

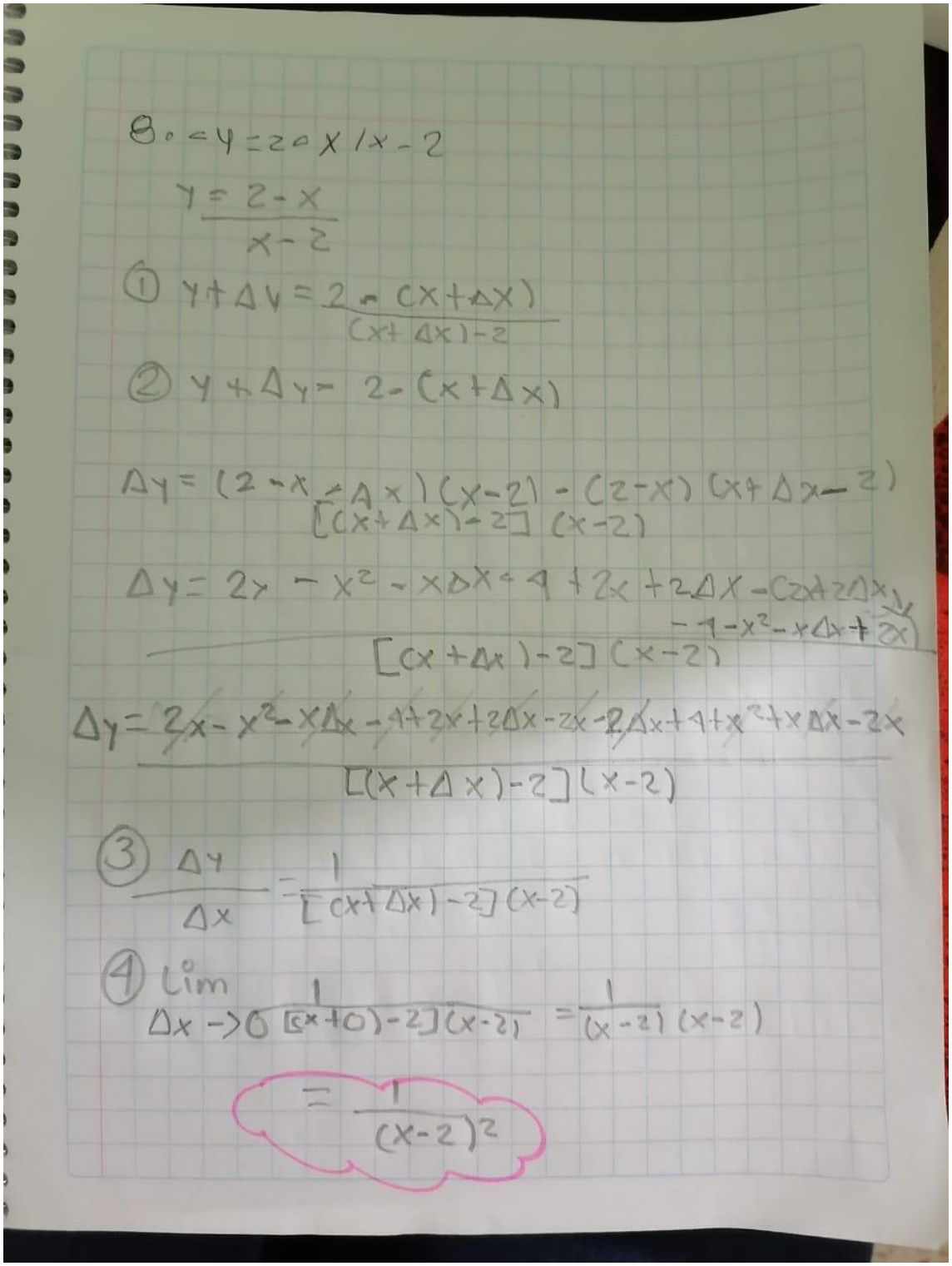
6.- Y = 2 / X2 + 4


6. $-y = 2/x^2+4$
$-y = \frac{2}{x^2}+4$
$-0 = \frac{2}{x^2}+4$
$-0 = \frac{2}{x^2}+4, x \neq 0$
$0 = \frac{2}{x^2}+4$
$-y = \frac{2}{x^2}+4$
$-\frac{d}{dy}(y) = \frac{d}{dy}\left(\frac{2}{x^2}\right)+\frac{d}{dy}(4)$
$-1 = \frac{d}{dy}\left(\frac{2}{x^2}\right) \times \frac{d}{dy}(4)$
$-1 = \frac{d}{dy}\left(\frac{2}{x^2}\right)+0$
$-1 = \frac{d}{dx}\left(\frac{2}{x^2}\right) \times \frac{dx}{dy}$
$-1 = \left(-2 \times \frac{\frac{d}{dx}(x^2)}{(x^2)^2}\right) \times \frac{dx}{dy}$
$\frac{d}{dx}(x^n) = nx^{n-1}$
$-1\left(-2 \times \frac{2x}{(x^2)^2}\right) \times \frac{dx}{dy}$
$-1 = -\frac{4}{x^3} \times \frac{dx}{dy}$
$\frac{x^3}{4} = \frac{dx}{dy}$
$\frac{dx}{dy} = \frac{x^3}{4} \longrightarrow \frac{dx}{dy} = \frac{x^3}{4}$

7.- Y = (1 + 2X) 2


7.- $y = (1+2x)^2$
$y = (1+2x)^2$
$y+\Delta y = [1+2(x+\Delta x)]^2$
$y+\Delta y - y = [1+2(x+\Delta x)]^2 - (1+2x)^2$
$\Delta y = (1+2x+2\Delta x)^2 - (1+4+4x^2)$
$\Delta y = 1+4x^2+4\Delta x^2+4x+4\Delta x+8x\Delta x-1-x-4x^2$
$\frac{\Delta y}{\Delta x} = \frac{4x+4\Delta x+8x\Delta x}{\Delta x} =$
$\lim_{\Delta x \to} \; 4x+4+8x = 12x+4$

8.- Y = 2 – X / X – 2


8.- Y = 2 - X / X - 2
y = 2 - x / x - 2
① y + Δy = 2 - (x + Δx) / (x + Δx) - 2
② y + Δy = 2 - (x + Δx)
Δy = (2 - x - Δx)(x - 2) - (2 - x)(x + Δx - 2) / [(x + Δx) - 2](x - 2)
Δy = 2x - x² - xΔx + 4 + 2x + 2Δx - (2x + 2Δx - 1 - x² - xΔx + 2x) / [(x + Δx) - 2](x - 2)
Δy = 2x - x² - xΔx - 4 + 2x + 2Δx - 2x - 2Δx + 1 + x² + xΔx - 2x / [(x + Δx) - 2](x - 2)
③ Δy / Δx = 1 / [(x + Δx) - 2](x - 2)
④ lim Δx → 0 1 / [(x + 0) - 2](x - 2) = 1 / (x - 2)(x - 2)
= 1 / (x - 2)²