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§ 2

$$G(x) = f(g(x))$$

$$G'(2) = f'(g(2)) \cdot g'(2)$$

(27) $g'(8)$ $\quad f(-1) = 4 \quad f'(-1) = 12$

$g'(8) = \dfrac{1}{f'(-1)}$ $\quad g(8) = -1$

$= \dfrac{1}{12}$

(109) $\frac{d}{dx}(x^3 - y^3 = 3xy - 3)$

$3x^2 - 3y^2y' = 3xy' + 3y$

$3x^2 - 3y = 3xy' + 3y^2y'$

$x^2 - y = xy' + y^2y'$

$= y'(x + y^2)$

$y' = \frac{x^2 - y}{x + y^2} = 0$ $\quad x^2 - y = 0$

$y = x^2$

$x^3 - (x^2)^3 = 3x(x^2) - 3$

$x^3 - x^6 = 3x^3 - 3$

$= x^6 + 2x^3 - 3$

$= (x^3 + 3)(x^3 - 1) = 0$

$x^3 + 3 = 0$ $\quad x^3 - 1 = 0$

$x^3 = -3$ $\quad x = 1$

$x = \sqrt[3]{-3}$ $\quad y = 1$

$y = (\sqrt[3]{-3})^2$

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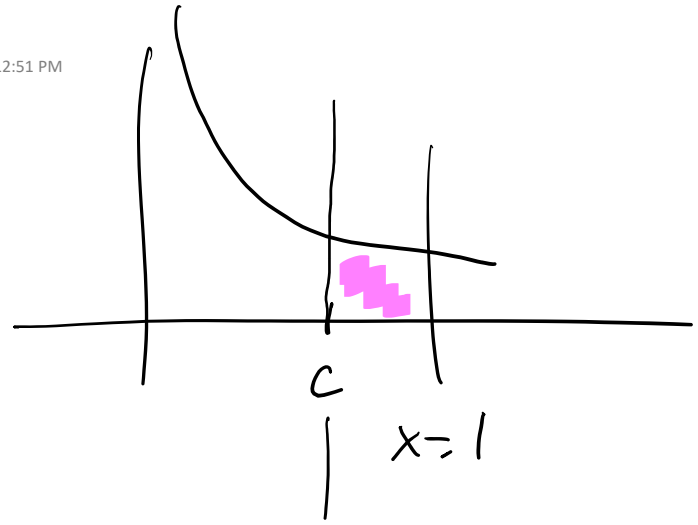


$$\int_c^1 \frac{1}{x}\,dx$$

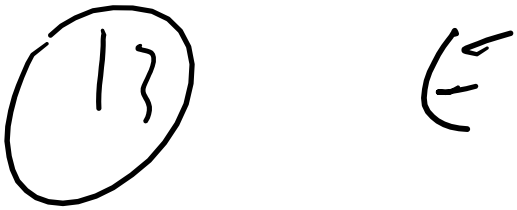
$$= \ln x \Big|_c^1$$

$$= \ln 1 - \ln c$$

$$= -\ln c$$

$$= \ln c^{-1} = \ln \frac{1}{c}$$

(B)



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Newton's Method

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

$f(x) = x^3 + 2x + 5$

$f'(x) = 3x^2 + 2$

$x_1 = -1.3$

$$x_2 = -1.3 - \frac{f(-1.3)}{f'(-1.3)}$$

$x_2 = -1.328$