OPCIÓN A

① $y = \frac{1}{3}\sqrt[4]{x} - \sqrt[3]{x} + \frac{2}{x} + \pi$

$y' = \frac{1}{12}(x)^{-3/4} - \frac{1}{3}(x)^{-2/3} - \frac{2}{x^2} = \frac{1}{12\sqrt[4]{x^3}} - \frac{1}{3\sqrt[3]{x^2}} - \frac{2}{x^2}$

B.

② $y = \ln\left(\frac{2x+3}{3x+2}\right) = \ln(2x+3) - \ln(3x+2)$

$y' = \frac{1}{2x+3}\cdot 2 - \frac{1}{3x+2}\cdot 3 = \frac{2}{2x+3} - \frac{3}{3x+2} = \frac{6x+4-6x-9}{(2x+3)(3x+2)} =$

$= \frac{-5}{(2x+3)(3x+2)}$

B.

③ $y = tg(3x+5)$

$y' = \frac{1}{\cos^2(3x+5)}\cdot 3 = \frac{3}{\cos^2(3x+5)}$

B

④ $y = \frac{4x^2-9}{x^2-25}$

$y' = \frac{8x\cdot(x^2-25) - (4x^2-9)\cdot 2x}{(x^2-25)^2} = \frac{8x^3 - 200x - 8x^3 + 18x}{(x^2-25)^2} = \frac{-182x}{(x^2-25)^2}$

B.

⑤ $y = e^{5x^3-1}$

$y' = e^{5x^3-1}\cdot 15x^2 = 15x^2\cdot e^{5x^3-1}$

B.

⑥ $y = \cos^2(5x - 3/2) = (\cos(5x-3/2))^2$

$y' = 2[\cos(5x-3/2)]\cdot(-\mathrm{sen}(5x-3/2))\cdot 5 = -10\cdot\cos(5x-3/2)\cdot\mathrm{sen}(5x-3/2) =$

$= -5\cdot\mathrm{sen}(10x-3)$

B.

⑦ $y = \frac{3x-2}{\ln x}$

$y' = \frac{3\ln x - (3x-2)\cdot\frac{1}{x}}{\ln^2 x} = \frac{3\ln x - \frac{3x-2}{x}}{\ln^2 x}$

B

⑧ $y = sen(\sqrt{3x^2\ 5x})$

$y' = \cos(\sqrt{3x^2-5x}) \cdot \frac{1}{2}(3x^2-5x)^{-1/2} \cdot 6x - 5 = \frac{(6x-5)(\cos\sqrt{3x^2-5x})}{2\sqrt{3x^2-5x}}$

B.

⑨ $y = (1-7x)^5$

$y' = 5(1-7x)^4 \cdot (-7) = -35(1-7x)^4$

B.

⑩ $y = \frac{ex - e^x}{x}$

$y' = \frac{(e - e^x) \cdot x - (ex - e^x) \cdot 1}{x^2} = \frac{ex - x \cdot e^x - ex + e^x}{x^2} = \frac{-x \cdot e^x + e^x}{x^2} =$

$= \frac{e^x(-x+1)}{x^2}$

B.

OPCIÓN B

① $y = \frac{4}{3}\sqrt[4]{x} - \sqrt[3]{x} - \frac{2}{x} + \pi x = \frac{4}{3}(x)^{1/4} - x^{1/3} - \frac{2}{x} + \pi x$

$y' = \frac{1}{3} \cdot x^{-3/4} - \frac{1}{3}x^{-2/3} + \frac{2}{x^2} + \pi = \frac{1}{3\sqrt[4]{x^3}} - \frac{1}{3\sqrt[3]{x^2}} + \frac{2}{x^2} + \pi$ B.

② $y = \ln\left(\frac{3x+2}{2x+3}\right) = \ln(3x+2) - \ln(2x+3)$

$y' = \frac{1}{3x+2} \cdot 3 - \frac{1}{2x+3} \cdot 2 = \frac{3}{3x+2} - \frac{2}{2x+3} = \frac{\cancel{6x} + 9 - \cancel{6x} - 4}{(3x+2)(2x+3)} =$

$= \frac{5}{(3x+2)(2x+3)}$ B

③ $y = tg(x^2+5)$

$y' = \frac{1}{\cos^2(x^2+5)} \cdot 2x = \frac{2x}{\cos^2(x^2+5)}$ B.

④ $y = \frac{4x^2+9}{x^2-25}$

$y' = \frac{8x(x^2-25) - (4x^2+9) \cdot 2x}{(x^2-25)^2} = \frac{\cancel{8x^3} - 200x - \cancel{8x^3} - 18x}{(x^2-25)^2} =$

$= \frac{-218x}{(x^2-25)^2}$ B

⑤ $y = e^{6x^3-2x}$

$y' = e^{6x^3-2x} \cdot (18x^2 - 2) = (18x^2-2)\, e^{6x^3-2x}$

⑥ $y = sen^2(5x - \frac{3}{2})$

$y' = 2\, sen(5x - 3/2) \cdot \cos(5x-3/2) \cdot 5 = 10\, sen(5x-3/2)\cos(5x-3/2) =$

$= 5\, sen(10x-3)$ B

⑦ $y = \dfrac{4x-3}{\ln x}$

$$y' = \frac{4\ln x - (4x-3)\cdot \frac{1}{x}}{\ln^2 x} = \frac{4\ln x - \frac{4x-3}{x}}{\ln^2 x}$$

B.

⑧ $y = \text{sen}\left(\sqrt{3x^2-5x}\right)$

$$y' = \cos\left(\sqrt{3x^2-5x}\right) \cdot \frac{1}{2}(3x^2-5x)^{-1/2} \cdot 6x-5 = \frac{(6x-5)\cdot\cos\left(\sqrt{3x^2-5x}\right)}{2\sqrt{3x^2-5x}}$$

B.

⑨ $y = (1-5x)^5$

$$y' = 5(1-5x)^4 \cdot (-5) = -25(1-5x)^4$$

B.

⑩ $y = \dfrac{ex - e^x}{x}$

$$y' = \frac{(e - e^x)\cdot x - (ex - e^x)\cdot 1}{x^2} = \frac{\cancel{ex} - x\cdot e^x - \cancel{ex} + e^x}{x^2} =$$

$$= \frac{e^x(-x+1)}{x^2}$$

B