DERIBATUAK.

8. orrialdea.

1.) $f(x) = 2x+1 \longrightarrow f'(x) = \boxed{2}$

2.) $f(x) = \frac{3x-2}{4} = \frac{3x}{4} - \frac{2}{4} = \frac{3x}{4} - \frac{1}{2} \longrightarrow f'(x) = \boxed{\frac{3}{4}}$

3.) $f(x) = \frac{3}{4} \longrightarrow f'(x) = \boxed{0}$

4.) $f(x) = \frac{x}{2} + 3 = \frac{1}{2}x + 3 \longrightarrow f'(x) = \boxed{\frac{1}{2}}$

5.) $f(x) = x^3 - 3x^2 + 2 \longrightarrow f'(x) = \boxed{3x^2 - 6x}$

6.) $f(x) = \frac{3x^5}{5} - \frac{4x}{3} + 5 = \frac{3}{5}x^5 - \frac{4}{3}x + 5 \longrightarrow f'(x) = \frac{3\cdot\cancel{5}}{\cancel{5}}x^4 - \frac{4}{3} = \boxed{3x^4 - \frac{4}{3}}$

7.) $f(x) = \frac{4\pi - 2}{3} \longrightarrow f'(x) = \boxed{0.}$

8.) $f(x) = \frac{4}{3}\left(x^2 - \frac{3}{4}x + 2\right) \longrightarrow f'(x) = \frac{4}{3}\left(2x - \frac{3}{4}\right) = \boxed{\frac{8x}{3} - 1}$

9.) $\frac{x^2}{5} - \frac{x}{4} + \sqrt{5} \longrightarrow f'(x) = \boxed{\frac{2x}{5} - \frac{1}{4}}$

10.) $\frac{x}{7} - \sqrt{7x} = \frac{1}{7}x - \sqrt{7}\cdot x^{1/2} \longrightarrow f'(x) = \frac{1}{7} - \frac{\sqrt{7}}{2}x^{\frac{1}{2}-1} = \frac{1}{7} - \underbrace{\frac{\sqrt{7}}{2\sqrt{x}}\cdot\frac{\sqrt{x}}{\sqrt{x}}}$

$= \frac{1}{7} - \frac{\sqrt{7x}}{2x} = \frac{2x - 7\sqrt{7x}}{7x}$

11.) $f(x) = \frac{1}{x} = x^{-1} \longrightarrow f'(x) = (-1)x^{-2} = \boxed{\frac{-1}{x^2}}$

12.) $f(x) = \frac{3}{x^2} = 3x^{-2} \longrightarrow f'(x) = 3(-2)x^{-3} = \boxed{\frac{-6}{x^3}}$

13.) $f(x) = \frac{5}{3x^3} = \frac{5}{3}\cdot x^{-3} \longrightarrow f'(x) = \frac{5(-3)}{3}x^{-4} = \boxed{\frac{-5}{x^4}}$

14.) $f(x) = \sqrt[3]{x^4} = x^{4/3} \longrightarrow f'(x) = \frac{4}{3}x^{\frac{4}{3}-1} = \frac{4}{3}x^{1/3} = \frac{4\sqrt[3]{x}}{3}$

15.) $f(x) = \frac{\sqrt{3x}}{x^2} = \frac{\sqrt{3}\cdot\sqrt{x}}{x^2}$

$= \sqrt{3}x^{1/2-2} = \sqrt{3}\cdot x^{-3/2}$

$\longrightarrow f'(x) = \sqrt{3}\left(\frac{-3}{2}\right)\cdot x^{-3/2-1} =$

$-\frac{3\sqrt{3}}{2}x^{-5/2} = \frac{-3\sqrt{3}}{2\sqrt{x^5}} =$

$= \frac{-3\sqrt{3}}{2x^2\sqrt{x}}\cdot\frac{\sqrt{x}}{\sqrt{x}} = \frac{-3\sqrt{3x}}{2x^3}$

(2)

16) $f(x) = \frac{3\sqrt{x^3}}{2x^4} = \frac{3}{2}x^{3/2-4} = \frac{3}{2}\cdot x^{-5/2} \longrightarrow f'(x) = \frac{3}{2}\left(-\frac{5}{2}\right)\cdot x^{-5/2-1} =$

$= \frac{-15}{4}\cdot x^{-7/2} = \frac{-15}{4\sqrt{x^7}} = \frac{-15}{4x^3\sqrt{x}}\cdot\frac{\sqrt{x}}{\sqrt{x}}$

$= \boxed{\frac{-15\sqrt{x}}{4x^4}}$

17) $f(x) = \frac{2}{x} + \frac{x}{2} = 2x^{-1} + \frac{1}{2}x \longrightarrow f'(x) = 2\cdot(-1)x^{-2} + \frac{1}{2} = \boxed{\frac{-2}{x^2} + \frac{1}{2}}$

18.) $f(x) = \frac{\sqrt[3]{x^2}}{3} - \frac{x}{3} + \sqrt{5} = \frac{1}{3}\cdot x^{2/3} - \frac{1}{3}\cdot x + \sqrt{5}$

$f'(x) = \frac{1}{3}\cdot\frac{2}{3}\cdot x^{2/3-1} - \frac{1}{3} = \frac{2}{9}x^{-1/3} - \frac{1}{3} = \frac{2}{9\sqrt[3]{x}}\frac{\sqrt[3]{x^2}}{\sqrt[3]{x^2}} - \frac{1}{3} =$

$= \frac{2\sqrt[3]{x^2}}{9x} - \frac{1}{3} = \boxed{\frac{2\sqrt[3]{x^2} - 3x}{9x}}$

19.) $f(x) = \sqrt[4]{\frac{1}{x^3}} = x^{-3/4} \longrightarrow f'(x) = -\frac{3}{4}x^{-3/4-1} = \frac{-3}{4}x^{-7/4} =$

$= \frac{-3}{4\sqrt[4]{x^7}} = \frac{-3}{4x\sqrt[4]{x^3}}\cdot\frac{\sqrt[4]{x}}{\sqrt[4]{x}} = \frac{-3\sqrt[4]{x}}{4x^2}$

20.) $f(x) = \sqrt{\frac{3}{x^5}} = \sqrt{3}\cdot x^{-5/2} \longrightarrow f'(x) = \sqrt{3}\cdot\left(\frac{-5}{2}\right)x^{-\frac{5}{2}-1} = \frac{-5\sqrt{3}}{2\sqrt{x^7}} =$

$= \frac{-5\sqrt{3}}{2x^3\sqrt{x}}\cdot\frac{\sqrt{x}}{\sqrt{x}} = \boxed{\frac{-5\sqrt{3x}}{2x^4}}$

21.) $f(x) = \frac{2\sqrt{x}}{x} - \frac{3}{x^2} + \frac{1}{x} = 2x^{\frac{1}{2}-1} - 3x^{-2} + x^{-1} = 2x^{-1/2} - 3x^{-2} + x^{-1}$

$f'(x) = 2\cdot\left(\frac{-1}{2}\right)x^{-1/2-1} - 3\cdot(-2)\cdot x^{-2-1} + (-1)\cdot x^{-1-1} =$

$= -x^{-3/2} + 6x^{-3} - x^{-2} = -\frac{1}{\sqrt{x^3}} + \frac{6}{x^3} - \frac{1}{x^2}$

$= -\frac{1}{x\sqrt{x}}\cdot\frac{\sqrt{x}}{\sqrt{x}} + \frac{6}{x^3} - \frac{1}{x^2} = \boxed{\frac{-\sqrt{x}}{x^2} + \frac{6}{x^3} - \frac{1}{x^2}}$

22.) $f(x) = x - \frac{3\sqrt{5}}{4} + \frac{1}{x^2} = x - \frac{3\sqrt{5}}{4} + x^{-2}$

$f'(x) = 1 - 0 + (-2)x^{-2-1} = 1 - 2x^{-3} = \boxed{1 - \frac{2}{x^3}}$

23.) $f(x) = \frac{x^2}{3} - \frac{3}{x^2} + \frac{3\sqrt{5}}{2} = \frac{1}{3}x^2 - 3\cdot x^{-2} + \frac{3\sqrt{5}}{2}$

$f'(x) = \frac{2}{3}x - 3(-2)x^{-3} + 0 = \boxed{\frac{2x}{3} + \frac{6}{x^3}}$

24.) $f(x) = \frac{x^3}{3} - 4\sqrt{x} - \frac{2}{x^3} - \underbrace{x^2\sqrt{x}}_{} = \frac{1}{3}x^3 - 4\cdot x^{1/2} - 2x^{-3} - x^{2+1/2}$ $5/2$

$f'(x) = \cancel{\frac{1}{3}}\cdot\cancel{3}\cdot x^2 - \frac{4}{2}x^{\frac{1}{2}-1} - 2(-3)x^{-4} - \frac{5}{2}x^{5/2-1} = \boxed{x^2 - \frac{2}{\sqrt{x}} + \frac{6}{x^4} - \frac{5}{2}\sqrt{x^3}}$

$-1/2$ $3/2$

25.) $f(x) = \frac{x^2 - 3x + 1}{x} = \frac{x^2}{x} - \frac{3x}{x} + \frac{1}{x} = x - 3 + \underbrace{\frac{1}{x}}_{x^{-1}}$

$f'(x) = 1 - 0 + (-1)x^{-1-1} = 1 - x^{-2} = 1 - \frac{1}{x^2} = \boxed{\frac{x^2-1}{x^2}}$

10. orrialdea

1) $f(x) = 3\sin x - 2\cos x \longrightarrow f'(x) = 3\cos x + 2\sin x$

2) $f(x) = 4\operatorname{tg} x + e^x \longrightarrow f'(x) = \frac{4}{\cos^2 x} + e^x$

3) $f(x) = x\cdot \ln x \xrightarrow{\text{Biderkita}} f'(x) = 1\cdot\ln x + x\cdot\frac{1}{x} = \boxed{\ln x + 1}$

$f'g + f g'$

4) $f(x) = x\cdot e^x \longrightarrow f'(x) = 1\cdot e^x + x\cdot e^x = \boxed{e^x(1+x)}$

5) $f(x) = (x^2+1)\cdot\sin x \longrightarrow f'(x) = 2x\cdot\sin x + (x^2+1)\cdot\cos x$

6) $f(x) = 2^x\cdot\operatorname{tg} x \longrightarrow f'(x) = 2^x\cdot\ln 2\cdot\operatorname{tg} x + \frac{2^x}{\cos^2 x}$

4

7.) $f(x) = x^2 - \underbrace{\frac{x}{3} e^x}_{\text{BİDERK.}} \longrightarrow f'(x) = 2x - \left(\overset{f'g}{\frac{1}{3}e^x} + \overset{fg'}{\frac{x}{3}e^x}\right)$

$$\boxed{f'(x) = 2x - \frac{1}{3}e^x - \frac{x}{3}e^x}$$

8.) $f(x) = \underbrace{(x^3 - 2x + 1)}_{f} \cdot \underbrace{\cos x}_{g} \longrightarrow f'(x) = \overset{f'g}{(3x^2 - 2)\cdot\cos x} + \overset{fg'}{(x^3 - 2x + 1)\cdot(-\sin x)}$

$f'(x) = (3x^2 - 2)\cdot\cos x - (x^3 - 2x + 1)\cdot\sin x.$

9.) $f(x) = 3^x + \ln x - \frac{1}{x}$ $\quad x^{-1}$

$f'(x) = 3^x \ln 3 + \frac{1}{x} - (-1)\,x^{-2} = \boxed{3^x \ln 3 + \frac{1}{x} + \frac{1}{x^2}}$

10.) $f(x) = 2^x + \log_2 x$

$f'(x) = \boxed{2^x \cdot \ln 2 + \frac{1}{x \cdot \ln 2}}$

11.) $f(x) = \underbrace{x^2 \cdot e^x} + \underbrace{2x \cdot \ln x}$

$f'(x) = \underbrace{2x \cdot e^x + x^2 e^x} + \underbrace{2 \cdot \ln x + \cancel{2x}\,\frac{1}{\cancel{x}}} =$

$= \boxed{2x \cdot e^x + x^2 \cdot e^x + 2\ln x + 2.}$

12.) $f(x) = \sqrt{x} \cdot \sin x - \log_3 5 = x^{1/2} \cdot \sin x - \log_3 5.$

$f'(x) = \frac{1}{2} \cdot x^{-1/2} \cdot \sin x + \sqrt{x} \cdot \cos x - 0$

$\quad f' \quad g \quad + \quad f \quad g'$

$= \frac{1}{2\sqrt{x}} \sin x + \sqrt{x} \cdot \cos x = \frac{\sin x + 2\overbrace{\sqrt{x}\sqrt{x}}^{x} \cdot \cos x}{2\sqrt{x}}$

$$= \boxed{\frac{\sin x + 2x\cos x}{2\sqrt{x}}}$$

ZATIKETA

13) $f(x) = \dfrac{4x}{x+1} = \dfrac{F(x)}{G(x)}$ $\qquad f'(x) = \dfrac{F'G - FG'}{G^2}$

$$f'(x) = \frac{4\cdot(x+1) - 4x\cdot 1}{(x+1)^2} = \frac{\cancel{4x}+4-\cancel{4x}}{(x+1)^2} = \frac{4}{(x+1)^2}$$

14.) $f(x) = \dfrac{x^2-1}{2x+2} \longrightarrow f'(x) = \dfrac{2x(2x+2)-(x^2-1)\cdot 2}{(2x+2)^2} \ldots$

Errazago!! Faktorizatu eta sinplifikatu.

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

$$\boxed{f'(x) = \frac{1}{2}}$$

15.) $f(x) = \dfrac{x+1}{x-2} \longrightarrow f'(x) = \dfrac{1\cdot(x-2) - (x+1)\cdot 1}{(x-2)^2} = \dfrac{\cancel{x}-2-\cancel{x}-1}{(x-2)^2}$

$$\boxed{f'(x) = \frac{-3}{(x-2)^2}}$$

16.) $f(x) = \dfrac{\ln x}{x} \longrightarrow f'(x) = \dfrac{\frac{1}{\cancel{x}}\cdot\cancel{x} - \ln x\cdot 1}{x^2} = \boxed{\dfrac{1-\ln x}{x^2}}$

17.) $f(x) = \dfrac{e^x+e^{-x}}{2} = \dfrac{1}{2}(e^x + e^{-x})$ $\longrightarrow$ katearen erregela.

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

18.) $f(x) = \dfrac{1}{x^2+1} \longrightarrow f'(x) = \dfrac{0\cdot(x^2+1) - 1\cdot 2x}{(x^2+1)^2} = \boxed{\dfrac{-2x}{(x^2+1)^2}}$

19.) $f(x) = \dfrac{x^3}{x+2} \longrightarrow f'(x) = \dfrac{3x^2(x+2) - x^3\cdot 1}{(x+2)^2}$

$$= \frac{3x^3+6x^2-x^3}{(x+2)^2} = \boxed{\frac{2x^3+6x^2}{(x+2)^2}}$$

⑥

20.) $f(x) = \frac{2x-1}{3x+2} \longrightarrow f'(x) = \frac{2(3x+2)-(2x-1)\cdot 3}{(3x+2)^2} =$

$= \frac{\cancel{6x}+4-\cancel{6x}+3}{(3x+2)^2} = \boxed{\frac{7}{(3x+2)^2}}$

21.) $f(x) = \frac{x^2}{x^2-1} \longrightarrow f'(x) = \frac{2x(x^2-1)-x^2(2x)}{(x^2-1)^2} =$

$= \frac{\cancel{2x^3}-2x-\cancel{2x^3}}{(x^2-1)^2} = \boxed{\frac{-2x}{(x^2-1)^2}}$

22.) $f(x) = \frac{\sqrt{x}}{x+2} \longrightarrow f' = \frac{\frac{1}{2\sqrt{x}}(x+2)-\sqrt{x}\cdot 1}{(x+2)^2} =$

$= \frac{\frac{x+2}{2\sqrt{x}} - \frac{\sqrt{x}\cdot 2\sqrt{x}}{2\sqrt{x}}}{(x+2)^2} = \frac{\frac{x+2-2x}{2\sqrt{x}}}{(x+2)^2} = \boxed{\frac{2-x}{(x+2)^2\cdot 2\sqrt{x}}}$

x

23.) $f(x) = (x^2-1)\cdot\sqrt{x}$

Produk $\rightarrow$ $f'(x) = 2x\cdot\sqrt{x} + (x^2-1)\cdot\frac{1}{2\sqrt{x}} = \frac{2x\sqrt{x}\cdot 2\sqrt{x}}{2\sqrt{x}} + \frac{x^2-1}{2\sqrt{x}} =$

$= \frac{4x^2+x^2-1}{2\sqrt{x}} = \boxed{\frac{5x^2-1}{2\sqrt{x}}}$

24.) $f(x) = 3\arcsin x \longrightarrow f'(x) = \frac{3}{\sqrt{1-x^2}}$

25.) $f(x) = 2\cdot\operatorname{arccos} x + e^x \longrightarrow f'(x) = \frac{-2}{\sqrt{1-x^2}} + e^x$

26.) $y = 5\operatorname{arctg} x \longrightarrow f'(x) = \frac{1}{1+x^2}$

27.) $y = \frac{x\cdot e^x - \ln x}{2} \longrightarrow f'(x) = \frac{1}{2}\cdot\left(1\cdot e^x + x\cdot e^x - \frac{1}{x}\right) = \boxed{\frac{xe^x + x^2e^x - 1}{2x}}$

28) $f(x) = 3^x \cdot \sin x - \log_2 x$

$f'(x) = 3^x \cdot \ln 3 \cdot \sin x + 3^x \cdot \cos x - \frac{1}{x \ln 2}$

KATEAREN ERREGELA : Fn KONPOSATUAK

13. orrialdea

1.) $f(x) = (x^2+5)^6$

$f'(x) = 6 \cdot (x^2+5)^5 \cdot (x^2+5)' = 6(x^2+5)^5 \cdot 2x = \boxed{12x(x^2+5)^5}$

2.) $f(x) = \sin(x^2-1)$

$f'(x) = \cos(x^2-1) \cdot (x^2-1)' = \boxed{2x \cdot \cos(x^2-1)}$

3.) $f(x) = \cos(\ln x)$

$f'(x) = -\sin(\ln x) \cdot (\ln x)' = \boxed{-\frac{\sin(\ln x)}{x}}$

4.) $f(x) = tg(2x-3x^2)$

$f'(x) = [1 + tg^2(2x-3x^2)] \cdot (2x-3x^2)'$

$= \boxed{(-6x+2) \cdot [1+tg^2(2x-3x^2)]}$

5.) $f(x) = e^{3x^2+1}$

$f'(x) = e^{3x^2+1} \cdot (3x^2+1)' = \boxed{6x \cdot e^{3x^2+1}}$

6.) $f(x) = 2^{4x+1}$

$f'(x) = 2^{4x+1} \ln 2 \cdot (4x+1)' = 2^{4x+1} \cdot \ln 2 \cdot 4$

$= \boxed{4 \cdot \ln 2 \cdot 2^{4x+1}}$

7.) $f(x) = \cos^2 x$

$$f'(x) = 2\cdot\cos x\cdot(\cos x)' = 2\cdot\cos x\cdot(-\sin x) =$$
$$= -2\cos x\cdot\sin x = \boxed{-\sin(2x)}$$

$\boxed{\sin 2x = 2\cdot\sin x\cdot\cos x}$

8.) $f(x) = e^{3x}$

$$f'(x) = e^{3x}\cdot(3x)' = \boxed{3\cdot e^{3x}}$$

9.) $f(x) = \ln(3x^2-6)$

$$f'(x) = \frac{1}{3x^2-6}\cdot(3x^2-6)' = \frac{6x}{3x^2-6} = \frac{6x}{3(x^2-2)} = \boxed{\frac{2x}{x^2-2}}$$

10.) $f(x) = \ln\left(\frac{3x^2-1}{2}\right) = \ln(3x^2-1) - \ln 2.$

LOGARIT. PROP !! $\boxed{\ln\frac{F(x)}{G(x)} = \ln F(x) - \ln G(x)}$

$$f'(x) = \frac{1}{3x^2-1}\cdot(3x^2-1)' - 0 = \boxed{\frac{6x}{3x^2-1}}$$

11.) $f(x) = \operatorname{arctg}(3x^2+2x)$

$$f'(x) = \frac{1}{1+(3x^2+2x)^2}\cdot(3x^2+2x)' = \frac{6x+2}{1+(3x^2+2x)^2}$$
$$= \boxed{\frac{6x+2}{9x^4+12x^3+4x^2+1}}$$

12.) $f(x) = \arcsin(x^2)$

$$f'(x) = \frac{1}{\sqrt{1-(x^2)^2}}\cdot(x^2)' = \boxed{\frac{2x}{\sqrt{1-x^4}}}$$

13.) $f(x) = \arccos(x^3-1)$

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

$$= \boxed{\frac{-3x^2}{\sqrt{x^6+2x^3}}}$$

18) $f(x) = \left(\frac{x^2-1}{x+2}\right)^2$

$$f'(x) = 2 \cdot \frac{x^2-1}{x+2} \cdot \left(\frac{x^2-1}{x+2}\right)' = 2\,\frac{x^2-1}{x+2} \cdot \frac{2x\cdot(x+2)-(x^2-1)\cdot 1}{(x+2)^2}$$

$$= 2\,\frac{x^2-1}{x+2} \cdot \frac{2x^2+4x-x^2+1}{(x+2)^2} = \frac{2(x^2-1)(x^2+4x+1)}{(x+2)^3}$$

19.) $f(x) = \sqrt{x^2-4x} = (x^2-4x)^{1/2}$

$$f'(x) = \frac{1}{2}(x^2-4x)^{\frac{1}{2}-1} \cdot (x^2-4x)' = \frac{1}{2\sqrt{x^2-4x}} \cdot 2x-4 =$$

$$= \boxed{\frac{x-2}{\sqrt{x^2-4x}}}$$

20.) $f(x) = \frac{x+1}{(x-2)^2}$

$$f'(x) = \frac{1\cdot(x-2)^2 - 2(x-2)\cdot(x+1)}{(x-2)^4} =$$

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

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

$$f'(x) = \frac{\underbrace{2(2x+1)\cdot(2x+1)'}_{f'} \cdot \underbrace{(x-1)}_{g} - \underbrace{(2x+1)^2}_{f} \cdot \underbrace{1}_{g'}}{(x-1)^2} =$$

$$= \frac{2(2x+1)\cdot 2\cdot(x-1) - (2x+1)^2}{(x-1)^2} = \frac{4\cdot(2x^2-2x+x-1)-4x^2-4x-1}{(x-1)^2}$$

$$= \frac{8x^2-4x-4-4x^2-4x-1}{(x-1)^2} = \boxed{\frac{4x^2-8x-5}{(x-1)^2}}$$

14.) $f(x) = \sin(3x^2-1)^2$

$f'(x) = \cos(3x^2-1)^2 \cdot ((3x^2-1)^2)'$

$= \cos(3x^2-1)^2 \cdot 2\cdot(3x^2-1)\cdot(3x^2-1)'$

$= \cos(3x^2-1)^2 \cdot 2\cdot(3x^2-1)\cdot 6x$

$= 12x(3x^2-1)\cdot\cos(3x^2-1)^2$

15.) $f(x) = \sin^2(3x^2-1) = [\sin(3x^2-1)]^2$

$f'(x) = 2\cdot\sin(3x^2-1)\cdot(\sin(3x^2-1))' =$

$= 2\cdot\sin(3x^2-1)\cdot\cos(3x^2-1)\cdot(3x^2-1)'$

$= \underbrace{2\cdot\sin(3x^2-1)\cdot\cos(3x^2-1)}\cdot 6x$

$\boxed{\sin 2x = 2\sin x\cdot\cos x}$

$= 6x\cdot\sin 2(3x^2-1)$

$= \boxed{6x\cdot\sin(6x^2-2)}$

16.) $f(x) = 3^{\cos x}$

$f'(x) = 3^{\cos x}\cdot\ln 3\cdot(\cos x)' = \ln 3\cdot(-\sin x)3^{\cos x}$

17) $f(x) = \ln\left(\frac{x+1}{x-2}\right)$ Log PROPIETI!! $\log\frac{F(x)}{G(x)} = \log F(x) - \log G(x)$

$f(x) = \ln(x+1) - \ln(x-2)$

$f'(x) = \frac{1}{x+1} - \frac{1}{x-2} = \frac{x-2-(x+1)}{(x+1)(x-2)} = \frac{-3}{(x+1)(x-2)}$

22) $f(x) = \dfrac{(3x-1)^2}{2x+1}$ Katia

$$f'(x) = \frac{\underbrace{2(3x-1)\cdot(3x-1)'}_{f'}\cdot\underbrace{(2x+1)}_{g} - \underbrace{(3x-1)^2}_{f}\cdot\underbrace{2}_{g'}}{(2x+1)^2}$$

$$= \frac{2(3x-1)\cdot 3\cdot(2x+1) - 2(3x-1)^2}{(2x+1)^2} =$$

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

$$= \frac{36x^2+18x-\cancel{12x}-6-18x^2+\cancel{12x}-2}{(2x+1)^2} =$$

$$= \boxed{\frac{18x^2+18x-8}{(2x+1)^2}}$$

23) $f(x) = \dfrac{e^x}{(x-1)^2}$

$$f'(x) = \frac{e^x(x-1)^2 - e^x\cdot 2(x-1)\cdot 1}{(x-1)^4} =$$

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

$$= \frac{e^x\cancel{(x-1)}(x-3)}{(x-1)^4} =$$

$$= \boxed{\frac{e^x(x-3)}{(x-1)^3}}$$

x^2-4x+3

$$\begin{array}{c|ccc} & 1 & -4 & 3 \\ 1 & & 1 & -3 \\ \hline & 1 & -3 & 0 \end{array}$$