(1) $y = 2x^3 - 6x^2 - 7x + 11$

$6x^2 - 12x - 7$

a) $\frac{11}{4}x^3 + \frac{7}{3}x^2$

$y' = \frac{33}{4}x^2 + \frac{14}{3}x$

(5) $y = 11 - 2x^2 - 6x^5$

$-4x - 18x^2$

(4)

$y = \frac{x^0}{x^2 - 8x}$ $\qquad \frac{v du - u dv}{v^2}$

$u = x \qquad v = x^2 - 8x$

$du = 1 \qquad dv = 2x - 8$

$v^2 = (x^2 - 8x)^2$

$y' = \frac{(x^2 - 8x)(1) - (x)(2x - 8)}{(x^2 - 8x)^2}$

$y' = \frac{x^2 - 8x - 2x^2 + 8x}{(x^2 - 8x)^2} = \frac{-x^2}{(x^2 - 8x)^2}$

(5) $y = \frac{5}{3x-4}$

$u = 5$ $\quad$ $u = 3x-4$

$du = 0$ $\quad$ $du = 3$

$$y' = \frac{(3x-4)(0) - 5(3)}{(3x-4)^2}$$

$$y' = \boxed{\frac{-15}{(3x-4)^2}}$$

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⑥ $y = \frac{(5x+2)}{(2x-1)}$

$u = 5x+2$ $\quad v = 2x-1$

$du = 5x-1$ $\quad dv = 2$

$v^2 = (2x-1)^2$

$y' = \frac{5(2x-1) - 2(5x+2)}{(2x-1)^2} = \frac{6x-5-(6x+4)}{(2x-1)^2}$

$= \frac{6x-5-6x-4}{(2x-1)^2} = \frac{-9}{(2x-1)^2}$

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

$= \frac{12x^2 - 6x^2 + 2}{4x^2} = \frac{6x^2 - 2}{4x^2}$

$= \frac{3}{2} - \frac{2}{4x^2}$

⑧ $y = 5\ln(4 + x^2)$

$u = 5 \quad v = 4 + x^2$

$du = 0 \quad dv = 2x$

$y' = (5)(2x) + (4 + x^2)(0) = y'$

$y' = 10x + (4 + x^2) = y' = \frac{10x + 2x^2 - 4}{(4 + x^2)^2}$

$(4 + x^2)^2 \quad 2(2x + 5)$

⑨ $y = (x^2 + 1)^2$

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

$u = x^2 + 1 \quad dv = 2x$

$y' = 4x(x^2 + 1)$

$du = 2x$

$u - 1 = x^2$

$u = x^2 + 1$

(10)

$$y = \frac{3}{5}x^2 - 3/4\,x + 1/8$$

$$\frac{3}{5}\frac{d}{dx}(x^2) - \frac{3}{4}\frac{d}{dx}(x) + \frac{d}{dx}(1/8)$$

$$\frac{3}{5}\left(\frac{2}{1}\right)x - \frac{3}{4}\left(\frac{1}{1}\right)$$

$$\left(\frac{6}{5}x - \frac{3}{4}\right)$$

$y' = 9x^2 \csc^2 3x^3$

(12)

$y = \underset{u}{3x^2} \cdot \underset{v}{\cos 3x^2}$

$u = 3x^2$ $\quad$ $v = \cos 3x^2$

$du = 6x$ $\quad$ $dv = -6x \sin 3x^2$

(11)

$y = \dfrac{2x^2}{\tan x^2}$

$u = 2x^2$ $\quad$ $v = \tan x^2$

$du = 4x$ $\quad$ $dv = 2x \sec^2 x^2$

$v^2 = (\tan x^2)^2$

$y' = \dfrac{4x \tan x^2 - 4x^3 \sec^2 x^2}{(\tan x^2)^2}$

$y' = \dfrac{4x(\tan x^2 - x^2 \sec x^2)}{(\tan x^2)^2}$

(13) $y = \sin x^2 \cos x^2$

$y = \sin x^2 \cdot \cos x^2$

$y' = (\sin x^2)(-2x \sin x^2) + (\cos x^2)(2x \cos x^2)$

$y' = (\sin^2)(-2x+1) + \cos x^2 (1+x2)$

$u = \sin x^2 \quad v = \cos x^2$

$du = 2x \cos x^2 \quad dv = 2x \sin^2$

(14) $y = \cot 9x^3$

$y' = \csc^2 9x^3 \frac{d}{dv} (9x^3)$

$y' = 9x^2 \csc^2 9x^3$

(15) $y = \sqrt{2x^3 \cos x^2} = \underbrace{\sqrt{2x^3}}_{u} \cdot \underbrace{\sqrt{\cos x^2}}_{v}$

$u = \sqrt{2x^3}$

$u = \left(\frac{1}{2} x^2\right)^{\frac{1}{2}}$

$u = 2^{\frac{1}{2}} \cdot x^{\frac{3}{2}}$

$du = 3x$

$du = 3\sqrt{x}$

$v = \sqrt{\cos x^2}$

$v = (\cos x^2)^{\frac{1}{2}}$

$dv = \frac{1}{2}(\cos x^2)$

$2x \operatorname{SEN} x^2$

$dv = \frac{x \operatorname{SEN} x^2}{\sqrt{\cos x^2}}$

$y = \sqrt{2x^3} \cdot \frac{x \operatorname{SEN} x^2}{\sqrt{\cos x^2}} + 3\sqrt{x}\sqrt{\cos x^2}$

$y' = \sqrt{2x^2} \cdot \frac{x \operatorname{SEN} x^2}{\sqrt{\cos x^2}} + 3\sqrt{x \cos x^2}$

(16)

$\sqrt{2x^3}\sec 2x$

$\downarrow$

$v = \sqrt{\sec 2x}$

$v = (\sec 2x)^{1/2}$

$dv = \frac{1}{2}(\sec 2x) \cdot 2\sec 2x \tan 2x$

(17) $y = 2x^3\sqrt{5x^3}$

$u = 2x^3 \quad v = \sqrt{5x^3}$

$du = 6x^2 \quad dv = 15x^2 \quad 2(5x^3)^{\frac{1}{2}} = \frac{15x^2}{2\sqrt{2x^3}}$

$y' = \frac{30x^5}{2\sqrt{5x^3}} + 6x^2\sqrt{5x^3}$
$2\sqrt{5x^3}$

(18) $y = 4\sec 2x^4$

$y' = 4\sec \quad y' = 4\sec 2x^4 \tan 2x^4 \cdot d(2x^4)$

$y' = 48x^3 \sec 2x^4 \cdot \tan 2x^4$

$y' = 32x^3 \sec x^4 \cdot \tan 2x^4$

(19) $= (\cos 2x^3)^0$

$u = \cos 2x^3$

$n = 0$

$n-1 = 2$

$du = -6x^2 \operatorname{sen} 2x^3$

$y' = 0\left(\cos 2x^3\right)^2 \cdot \left(-6x^2 \operatorname{sen} 2x^3\right)$

$y' = -18x^2 (\cos 2x^3)^2 \operatorname{sen} 2x^3$

(20) $= 1 / (\text{SEN}\, x^2)^2$

$y = (\text{SEN}\, x^2)^{-2}$

$u^n = n u^{n-1} \frac{du}{dx}$ $\quad n = -2$ $\quad u = \text{SEN}\, x^2$

$n - 1 = -3$ $\quad du = 2x \cos x^2$

$y' = -2 (\text{SEN}\, x^2)$

$y' = \frac{-2 (2x \cos x^2)}{(\text{SEN}\, x^2)^3}$

$y' = \frac{-4x \cos x^2}{(\text{SEN}\, x^2)^3}$