3-0235 — 50 SHEETS — 5 SQUARES
3-0236 — 100 SHEETS — 5 SQUARES
3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER
COMET

1) $y = \sin 4x$ let $u = 4x$
$y = \sin u$

$$\frac{dy}{dx} = \frac{dy}{du}\frac{du}{dx} = \cos u \cdot 4$$

$$\boxed{\frac{dy}{dx} = 4\cos 4x}$$

5) $y = e^{\sqrt{x}}$

let $u = \sqrt{x}$ $du = \frac{1}{2}x^{-1/2}$
$y = e^u$ $dy = e^u$

$$\frac{dy}{dx} = e^u \cdot \frac{1}{2}x^{-1/2}$$

$$\boxed{\frac{dy}{dx} = \frac{1}{2\sqrt{x}}e^{\sqrt{x}}}$$

8) $F(x) = (4x - x^2)^{100}$

$$F'(x) = 100(4x - x^2)^{99} \cdot (4 - 2x)$$

$$\boxed{F'(x) = 100(4 - 2x)(4x - x^2)^{99}}$$

9) $F(x) = \sqrt[4]{1 + 2x + x^3}$

$$= (1 + 2x + x^3)^{1/4}$$

$$F'(x) = \frac{1}{4}(1 + 2x + x^3)^{-3/4}(2 + 3x^2)$$

$$\boxed{F'(x) = \frac{2 + 3x^2}{4\sqrt[4]{(1 + 2x + x^3)^3}}}$$

13) $y = \cos(a^3 + x^3)$

$$\frac{dy}{dx} = -\sin(a^3 + x^3)(3x^2)$$

$$\boxed{\frac{dy}{dx} = -3x^2 \sin(a^3 + x^3)}$$

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15) $y = xe^{-kx}$

let $u = x$ $\quad du = 1$
$v = e^{-kx}$ $\quad dv = -k\,e^{-kx}$

$y' = uv' + vu'$

$= x(-ke^{-kx}) + e^{-kx} \cdot 1$

$$\boxed{y' = e^{-kx}(1 - kx)}$$

30) $G(y) = \left(\frac{y^2}{y+1}\right)^5$

let $u = \frac{y^2}{y+1}$ $\quad \frac{du}{dy} = \frac{(y+1)(2y) - (y^2)(1)}{(y+1)^2} = 2y^2 + 2y - y^2$

$g = u^5$ $\quad = \frac{2y^2 + 2y - y^2}{(y+1)^2}$

$= \frac{y^2 + 2y}{(y+1)^2}$

$\frac{dg}{dy} = \frac{dg}{du} \cdot \frac{du}{dy}$

$= 5\left(\frac{y^2}{y+1}\right)^4 \left(\frac{y^2+2y}{(y+1)^2}\right)$

$= 5\left(\frac{y^8}{(y+1)^4}\right)\left(\frac{y^2+2y}{(y+1)^2}\right)$

$$\boxed{G'(y) = \frac{5y^9(y+2)}{(y+1)^6}}$$

40) $y = \sin(\sin(\sin x))$

let $u = \sin x \quad du = \cos x$
$v = \sin u \quad dv = \cos u$
$y = \sin v \quad dy = \cos v$

$$\frac{dy}{dx} = \frac{dy}{dv} \cdot \frac{dv}{du} \cdot \frac{du}{dx}$$

$$= \cos v \cdot \cos u \cdot \cos x$$

$$= \cos(\sin u) \cdot \cos(\sin x) \cdot \cos x$$

$$\boxed{y' = \cos(\sin(\sin x)) \cdot \cos(\sin x) \cdot \cos x}$$

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