

Differentiate.

3. $f(x) = (x^3 + 2x)e^x$

5. $y = \frac{x}{e^x}$

7. $g(x) = \frac{1+2x}{3-4x}$

9. $H(u) = (u - \sqrt{u})(u + \sqrt{u})$

10. $J(v) = (v^3 - 2v)(v^{-4} + v^{-2})$

11. $F(y) = \left(\frac{1}{y^2} - \frac{3}{y^4}\right)(y + 5y^3)$

12. $f(z) = (1 - e^z)(z + e^z)$

13. $y = \frac{x^3}{1-x^2}$

15. $y = \frac{t^2+2}{t^4-3t^2+1}$

17. $y = e^p(p + p\sqrt{p})$

19. $y = \frac{v^3 - 2v\sqrt{v}}{v}$

21. $f(t) = \frac{2t}{2 + \sqrt{t}}$

23. $f(x) = \frac{A}{B + Ce^x}$

P.189 (3-23) c-1d

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

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

⑦ $\frac{dg}{dx} = \frac{(3-4x)(2) - (1+2x)(-4)}{(3-4x)^2}$

⑨ $\frac{dh}{du} = (u+\sqrt{u})(1 - \frac{1}{2}u^{-1/2}) + (u-\sqrt{u})(1 + \frac{1}{2}u^{-1/2})$
 $= (u+\sqrt{u})(1 - \frac{1}{2\sqrt{u}}) + (u-\sqrt{u})(1 + \frac{1}{2\sqrt{u}})$

⑪ $F(y) = (y^{-2} - 3y^{-4})(y + 5y^3)$

$\frac{dF}{dy} = (y + 5y^3)(-2y^{-3} + 12y^{-5}) + (y^{-2} - 3y^{-4})(1 + 15y^2)$

⑬ $y' = \frac{(1-x^2)(3x^2) - (x^3)(-2x)}{(1-x^2)^2}$

⑮ $\frac{dy}{dt} = \frac{(t^4 - 3t^2 + 1)(2t) - (t^2 + 2)(4t^3 - 6t)}{(t^4 - 3t^2 + 1)^2}$

⑰ $y = e^p(p + p \cdot p^{1/2}) = e^p(p + p^{3/2})$

$y' = (p + p^{3/2})e^p + e^p(1 + \frac{3}{2}p^{1/2})$

⑲ $y = \frac{v^3 - 2v^{3/2}}{v}$

$y' = \frac{v(3v^2 - 3v^{1/2}) - (v^3 - 2v^{3/2})(1)}{v^2}$

$$(21) \quad f(t) = \frac{2t}{2+t^{1/2}}$$

$$\frac{df}{dt} = \frac{(2+t^{1/2})(2) - (2t)(\frac{1}{2}t^{-1/2})}{(2+t^{1/2})^2}$$

$$(23) \quad \frac{df}{dx} = \frac{(B + Ce^x)(0) - (A)(Ce^x)}{(B + Ce^x)^2}$$

$$\frac{df}{dx} = \frac{-ACe^x}{(B + Ce^x)^2}$$