MCV 4UI Chapter 2 Derivative Rules Practice

Differentiate. Express all final answers in simplified/factored form.

1. $F(x) = (3x-2)(1-5x)$	**2.** $g(x) = Ax^2 + Bx + C$
3. $f(t) = \frac{\pi^2}{2-\pi t}$	**4.** $y = \sqrt{1-3x^2} \quad + C$
5. $F(t) = \left(2 + \frac{3}{t}\right)^{-10}$	**6.** $s = \frac{1+\sqrt{t}}{1-\sqrt{t}}$
7. $\frac{dy}{dx} = \frac{3}{5-4x}$	**8.** $s(t) = (1-2t^2)^{-3/2}$
9. $y = \frac{1}{2+\sqrt{3x+4}}$	**10.** $f(x) = \left(1 + \sqrt{\frac{x-2}{3}}\right)^4$
11. $y = \left(u + \frac{1}{u-1}\right)^{-\frac{5}{3}}$	**12.** $y = \frac{x^5\sqrt{3+x^6}}{(4+x^2)^3}$
13. $h(t) = 2t\sqrt{4-t^2}$	**14.** $y = \sqrt{x}\left(5 - x - \frac{x^2}{3}\right)$
15. $f(x) = \frac{6}{x^3} + \frac{2}{x^2} - 2$	**16.** $z = \frac{s^5 - s^3}{15}$
17. $y = x^{2018} - x^{-2017}$	**18.** $s(t) = t^{\frac{1}{3}} + 2t^{\frac{1}{4}} + 3t^{\frac{1}{5}}$
19. $v(t) = 3\sqrt[3]{t^2} - \frac{2}{\sqrt{t^3}}$	**20.** $g(u) = \frac{u\sqrt{u}-3}{u^2}$

FINAL ANSWERS

1. $F'(x) = -30x + 13$	**2.** $g'(x) = 2Ax + B$
3. $f'(t) = \frac{\pi^3}{(\pi t-2)^2}$	**4.** $\frac{dy}{dx} = -\frac{3x}{\sqrt{1-3x^2}}$
5. $F'(t) = 30\left(\frac{t^9}{(2t+3)^{11}}\right)$	**6.** $s' = \frac{1}{(\sqrt{t}-1)^2\sqrt{t}}$
7. $\frac{d^2y}{dx^2} = \frac{12}{(5-4x)^2}$	**8.** $v(t) = \frac{6t}{(1-2t^2)^{\frac{5}{2}}}$
9. $\frac{dy}{dx} = \frac{-3}{2\sqrt{3x+4}(2+\sqrt{3x+4})^2}$	**10.** $f'(x) = \frac{2(\sqrt{x-2}+\sqrt{3})^3}{9\sqrt{x-2}}$
11. $\frac{dy}{du} = \frac{-5u(u-2)(u-1)^{\frac{2}{3}}}{3(u^2-u+1)^{\frac{8}{3}}}$	**12.** $\frac{dy}{dx} = \frac{x^4(2x^8+32x^6-3x^2+60)}{(x^2+4)^4\sqrt{x^6+3}}$
13. $h'(t) = \frac{-4(t^2-2)}{\sqrt{(2-t)(2+t)}}$	**14.** $y' = -\frac{5x^2+9x-15}{6\sqrt{x}}$
15. $f'(x) = -\frac{4x+18}{x^4}$	**16.** $z' = \frac{s^2(5s^2-3)}{15}$
17. $\frac{dy}{dx} = \frac{2018x^{4035}+2017}{x^{2018}}$	**18.** $v(t) = \frac{10t^{\frac{2}{15}}+15t^{\frac{1}{20}}+18}{30t^{\frac{4}{5}}}$
19. $v'(t) = \frac{2t^{\frac{13}{6}}+3}{t^{\frac{5}{2}}}$	**20.** $g'(u) = -\frac{u^{\frac{3}{2}}-12}{2u^3}$