1) $f(x) = (3x+2)^8$

$f'(x) = 8\boxed{3x+2}^7 \cdot d\boxed{3x+2}$

$f'(x) = 8(3x+2)^7 \cdot (3)$

2) $f(x) = (1-x)^6$

$f'(x) = 6\boxed{1-x}^5 \cdot d\boxed{1-x}$

$f'(x) = 6(1-x)^5(-1)$

3) $f(x) = (1-2x^2)^3$

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

$f'(x) = 3(1-2x^2)^2 \cdot (-4x)$

4) $f(x) = (x^2+3x+1)^5$

$f'(x) = 5\boxed{x^2+3x+1}^4 \cdot d\boxed{x^2+3x+1}$

$f'(x) = 5(x^2+3x+1)^4(2x+3)$

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

$f'(x) = -3\boxed{x^2+2}^{-4} \cdot d\boxed{x^2+2}$

$f'(x) = -3(x^2+2)^{-4}(2x)$

$f'(x) = \dfrac{-6x}{(x^2+4)^4}$

6) $f(x) = \sqrt{x+1} = (x+1)^{1/2}$

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

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

$f'(x) = \dfrac{1}{2\sqrt{x+1}}$

7) $f(x) = (2x^2-3x+1)^4$

$f'(x) = 4\boxed{2x^2-3x+1}^3 \cdot d\boxed{2x^2-3x+1}$

$f'(x) = 4(2x^2-3x+1)(4x-3)$

8) $f(x) = \sqrt{x^2+2x-1}$

$f(x) = (x^2+2x-1)^{1/2}$

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

$= \dfrac{1}{2\sqrt{x^2+2x-1}} \cdot (2x+2)$

$f'(x) = \dfrac{x+1}{\sqrt{x^2+2x-1}}$

9) $f(x) = \dfrac{1}{\sqrt[3]{x^3+3}}$

$f(x) = (x^3+3)^{-1/3}$

$f'(x) = -\frac{1}{3}\boxed{x^3+3}^{-4/3} \cdot d\boxed{x^3+3}$

$f'(x) = \dfrac{-1}{3(x^3+3)^{4/3}} \cdot 3x^2$

$f'(x) = \dfrac{-x^2}{(x^3+3)^{4/3}}$

10) $f(x) = (x^2-4)^{-1/2}$

$f'(x) = -\frac{1}{2}\boxed{x^2-4}^{-3/2} \cdot d\boxed{x^2-4}$

$f'(x) = -\dfrac{1}{2(x^2-4)^{3/2}} \cdot (2x)$

$f'(x) = \dfrac{-x}{(x^2-4)^{3/2}}$

11) $f(x) = 6x^4 - 8x^3$

$f'(x) = 24x^3 - 24x^2$

12) $f(x) = \dfrac{2}{3x-5}$

$f(x) = 2(3x-5)^{-1}$

$f'(x) = -2\boxed{3x-5}^{-2} \cdot d\boxed{3x-5}$

$f'(x) = -2(3x-5)^{-2} \cdot (3)$

$f'(x) = \dfrac{-6}{(3x-5)^2}$

13) $f(x) = (-9x + \sqrt{x})^{-2}$

$f(x) = (-9x + x^{1/2})^{-2}$

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

14) $f(x) = \dfrac{1}{x^5}$

$f(x) = x^{-5}$

$f'(x) = -5x^{-6}$

$f'(x) = \dfrac{-5}{x^6}$

15) $f(x) = (4x^6 - 5x^5 + 5)^{23}$

$f'(x) = 23(4x^6 - 5x^5 + 5)^{22} \cdot (24x^5 - 25x^4)$

16)

$f(x) = 2x^3 - 2x - 7 \quad x = -1$

point: $(-1, -7)$

slope: $f'(x) = 6x^2 - 2$

$f'(-1) = 4$

Normal: $y + 7 = -\frac{1}{4}(x+1)$

17)

$f(x) = (2x+3)^3 \quad x = 0$

point: $(0, 27)$

slope: $f'(x) = 3\boxed{2x+3}^2 \cdot d\boxed{2x+3}$

$f'(x) = 3(2x+3)^2 \cdot (2)$

$f'(0) = 54$

Normal: $y - 27 = -\frac{1}{54}(x-0)$

18)

$f(x) = \sqrt{x-1}$ when $x = 5$

point: $(5, 2)$

slope: $f'(x) = \frac{1}{2}\boxed{x-1}^{-1/2} \cdot d\boxed{x-1}$

$f'(x) = \dfrac{1}{2\sqrt{x-1}}$

$f'(5) = \frac{1}{4}$

Normal: $y - 2 = -4(x-5)$

19)

$f(x) = \dfrac{2}{x^3} = 2x^3 \quad x = 2$

point: $(2, \frac{1}{4})$

slope: $f(x) = 2x^{-3}$

$f'(x) = -6x^{-4}$

$f'(2) = \dfrac{-6}{(2)^4} = -\dfrac{6}{16} = -\dfrac{3}{8}$

Normal: $y - \frac{1}{4} = \frac{8}{3}(x-2)$