

1.

$$\begin{aligned}
 y' &= \left((4x^3 + 7x^2)^6 \right)' = 6 \cdot (4x^3 + 7x^2)^5 \cdot (4x^3 + 7x^2)' = \\
 &= 6 (4x^3 + 7x^2)^5 \cdot (4 \cdot (x^3)' + 7 \cdot (x^2)') = 6 (12x^2 + 14x) (4x^3 + 7x^2)^5
 \end{aligned}$$

2.

$$\begin{aligned}
 y' &= \left(\frac{\sin(6x^5 + 2x)}{4} \right)' = \frac{1}{4} \cdot (\sin(6x^5 + 2x))' = \\
 &= \frac{1}{4} \cdot \cos(6x^5 + 2x) \cdot (6x^5 + 2x)' = \\
 &= \frac{\cos(6x^5 + 2x)}{4} \cdot (6 \cdot (x^5)' + 2 \cdot (x)') = \frac{(30x^4 + 2) \cos(6x^5 + 2x)}{4}
 \end{aligned}$$

3.

$$y' = (8 \arccos(2x^3))' = 8 \cdot (\arccos(2x^3))' = 8 \cdot \left(-\frac{1}{\sqrt{1-4x^6}} \right) \cdot (2x^3)' = -\frac{48x^2}{\sqrt{1-4x^6}}$$

4.

$$y' = (-2 \operatorname{ctg}(3x^4))' = -2 \cdot \left(-\frac{1}{\sin^2(3x^4)} \right) \cdot (3x^4)' = \frac{24x^3}{\sin^2(3x^4)}$$