1) $f(x) = \left(1 + 3\sin(2x)\right)^{\frac{1}{3}}$

2) $f'(x) = \frac{1}{3}\left(1 + 3\sin(2x)\right)^{\frac{1}{3}-1} \cdot \frac{d}{dx}\left(1 + 3\sin(2x)\right)$

3) $f'(x) = \frac{1}{3} \cdot \left(1 + 3 \cdot \sin(2x)\right)^{\frac{-2}{3}} \cdot 3 \cdot \cos(2x) \cdot \frac{d}{dx}(2x)$

4) $f'(x) = \frac{1}{3}\left(1 + 3\sin(2x)\right)^{\frac{-2}{3}} \cdot 3 \cdot \cos(2x) \cdot 2$

5) $f'(x) = \frac{1}{3} \cdot \frac{1}{\left(\sqrt[3]{1 + 3\sin(2x)}\right)^2} \cdot 6 \cdot \cos(2x) = \frac{2 \cdot \cos(2x)}{\left(\sqrt[3]{1 + 3\sin(2x)}\right)^2}$

1) Chain rule $\quad \frac{1}{3} - 1 = \frac{1}{3} - \frac{3}{3} = \frac{-2}{3}$

2) Chain rule again. The 1 goes because it's constant.