Simplify by combining like terms whenever possible.

1. $f(x) = \dfrac{5}{2x^2} + \dfrac{x^{-3}}{3x^1} + 3\sqrt{x} - 500$

2. $y = \dfrac{-1}{4x^2} + \cos x + \dfrac{2\sqrt{x}}{\sqrt[5]{x^2}}$

3. $y = \dfrac{2x^2}{x^{\frac{3}{4}}} + \dfrac{5x}{\sqrt[4]{x^5}}$ (put over a common denominator)

4. $f(x) = \dfrac{3}{4}\sqrt{x} - \dfrac{4}{\sqrt[4]{x}} + 2x - \dfrac{3x}{\sqrt{x^3}}$ (put over a common denominator)

5 *a.* $y = \dfrac{4}{x} - \dfrac{x}{x^{-3}} - \dfrac{8}{x^8}$

*b.* Find $f'(2)$

6 *a.* $f(x) = \dfrac{\sqrt{x}}{3x} - \dfrac{x^3 + 2x^{\frac{5}{2}} - 4x^{\frac{1}{2}}}{x^{\frac{3}{2}}}$ (put over a common denominator)