1. Simplify each expression

   $(a)\left(\frac{1}{-x}\right)^{-3}$

   $(b)(-x)^4 - x^4$

   $(c)\ \frac{x^{11}}{x^{12}} - \frac{x^{12}}{x^{11}}$

   $(d)\ \frac{\sqrt[5]{yx^4}}{\sqrt{x^4}}$

   $(f)\ \sqrt[4]{\frac{x^8}{y^{16}}}$

   $(g)\ (x^4)^{-5/4}$

2. Rationalize the denominator and simplify

   $(a)\ \frac{6}{\sqrt{x}+1}$

   $(b)\ \frac{6}{\sqrt{x}}$

3. Simplify each expression, elimating any negative exponents

   (a) $\sqrt{y^2x^3} - \sqrt{x}$

   (b) $(3a^3b^3)^2(2ab^2)$

   (c) $\sqrt[3]{\dfrac{27}{x^{-6}}}$

   (d) $\left(\dfrac{2x^{-3/4}y^3}{x^2y^{1/2}}\right)^{-4}$

4. Perform the indicated operations and simplify

   (a) $(x-y)^2 + x^2 - y^2$

   (c) $(\sqrt[3]{a} + \sqrt[3]{b})(\sqrt[3]{a} - \sqrt[3]{b})$

   (d) $(ab)^2 - a^2b^2 + \left(\dfrac{a}{b}\right)^2 - \dfrac{a^2}{b^2}$

5. Factor each expression completely

(a) $25 - 9y^2$

(b) $3x^2 + 7x - 20$

(c) $x^6 + x^4 + x^2 + 1$

(d) $(x^2 - 1)^{5/4} 4x^{3/2} - x^{-1/2}(x^2 - 1)^{1/4}$

(f) $x^3 y^2 - 9xy$

6. Simplify the rational expression

(a) $\dfrac{3}{2-\dfrac{1}{x}}$

(c) $\dfrac{2}{x+1}-\dfrac{1}{x^2-9x-10}$

(d) $\dfrac{\dfrac{y^2}{x}-\dfrac{x}{y^2}}{\dfrac{1}{y}-\dfrac{1}{x^2}}$