Exercise 2015-10ℰC-00001(1)

(1) Simplify, without using a calculator: (Write your answer as a positive exponent!)

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

(b) $(9a^3)^{-1}(4a^3b^{-2})^0$

(c) $81^{\frac{1}{2}} \times x^{\frac{1}{4}}y^{\frac{1}{3}} \div \left(x^{\frac{1}{2}}y^{\frac{1}{3}}\right)$

(d) $\dfrac{12^{x+1} \times 3^x}{9^{x-1} \times 4^x}$

(e) $\dfrac{2^{m-1} + 2^m}{2^{m+1}}$

(f) $\dfrac{5^{\frac{1}{2}} \times 20^{\frac{3}{4}} \times 8^{\frac{5}{6}}}{5^{\frac{1}{4}}}$

(g) $\dfrac{27^{y-2} \times 6^{y+1}}{162^y}$

(h) $\dfrac{3^{2p} + 3.3^{2p}}{9^p - 2.3^{2p+1}}$

(2) Solve for x:

(a) $25^x = 125$

(b) $2^{2x+1} = -4^x + 24$

(c) $3x^{\frac{3}{4}} = 24$

(d) $(x^3 + 8)(2^{3x-1} - 1) = 0$