CfE Higher Maths Homework ①

① Find the exact value of

(a) $\sin 135°$ (b) $\tan 210°$ (c) $\cos \frac{5\pi}{4}$

(d) $\tan \frac{2\pi}{3}$ (e) $\cos 240°$ (f) $\sin\left(\frac{-\pi}{6}\right)$

② Find in its simplest form the exact value of

$$\cos^2 \frac{4\pi}{3} - \sin^2 \frac{4\pi}{3}$$

③ The cell population of a bacterium is determined by $c = 10^6 e^{3t}$, where c is the number of cells and t is the time in days. How many cells are there after two days?

④ The mass of a fixed quantity of radioactive substance decays according to the formula $m = 50e^{-0.02t}$ where m is the mass and t is the time in years. What is the mass after 12 years?

⑤ Write in logarithmic form

(a) $2^5 = 32$ (b) $4^3 = 64$ (c) $9^{-\frac{1}{2}} = \frac{1}{3}$ (d) $y = 7^u$

⑥ Change to exponential form

(a) $x = \log_y 3$ (b) $r = \log_s 5$ (c) $p = \log_4 q$

(d) $w = \log_x y$ (e) $2a = \log_b c$ (f) $2n+1 = \log_n 4$