

Quiz 10

Question 1. (4 marks) Evaluate 1024^{64} expressing your answer in scientific notation.

$$\text{LET } x = 1024^{64}$$

$$\log x = 64 \log 1024$$

$$\log x = 192.6591972$$

$$x = 10^{192.6591972}$$

$$x = 10^{192} \cdot 10^{0.6591972}$$

$$x = 4.56 \times 10^{192}$$

Question 2. (6 marks) Solve for x:

(a) $15 \cdot 6^{x+2} = 23^x$

$$\ln 15 \cdot 6^{x+2} = \ln 23^x$$

$$\ln 15 + \ln 6^{x+2} = x \ln 23$$

$$\ln 15 + (x+2) \ln 6 = x \ln 23$$

$$\ln 15 + x \ln 6 + 2 \ln 6 = x \ln 23$$

$$x \ln 6 - x \ln 23 = -\ln 15 - 2 \ln 6$$

$$x(\ln 6 - \ln 23) = -\ln 15 - 2 \ln 6$$

$$x = \frac{-\ln 15 - 2 \ln 6}{\ln 6 - \ln 23}$$

$$= 4.682$$

(b) $\frac{1}{2} \log(x+2) + \log 5 = 1$

$$\log(x+2)^{1/2} + \log 5 = \log 10$$

$$\log 5(x+2)^{1/2} = \log 10$$

$$5(x+2)^{1/2} = 10$$

$$(x+2)^{1/2} = 2$$

$$x+2 = 2^2$$

$$x = 2$$