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Quiz 8

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

← mistake in question

Question 1. pg.142#26 (2 marks) Express in terms of a simple logarithm?

$$\begin{aligned}\ln \sqrt[3]{x\sqrt{y}} &= \ln (x\sqrt{y})^{1/3} = \frac{1}{3} \ln x\sqrt{y} = \frac{1}{3} [\ln x + \ln y^{1/2}] \\ &= \frac{1}{3} [\ln x + \frac{1}{2} \ln y] \\ &= \frac{1}{3} \ln x + \frac{1}{6} \ln y\end{aligned}$$

Question 2. pg.142#36 (2 marks) Express as a single logarithm with coefficient of one:

$$\begin{aligned}\frac{1}{2} \log x + \frac{3}{2} \log 2y - \log x^2 y &= \log x^{1/2} + \log (2y)^{3/2} - \log x^2 y \\ &= \log x^{1/2} (2y)^{3/2} - \log x^2 y \\ &= \log \frac{x^{1/2} (2y)^{3/2}}{x^2 y} = \log \frac{\sqrt{8} \sqrt{y}}{x^{3/2}}\end{aligned}$$

Question 3. pg.144#73 (6 marks) Solve for x:

$$\log_2(x+1) + \log_2(x+4) = 2$$

$$2 = \log_2(x+1)(x+4)$$

$$2 = \log_2 [x^2 + 5x + 4]$$

$$2^2 = 2^{\log_2 [x^2 + 5x + 4]}$$

$$4 = x^2 + 5x + 4$$

$$0 = x^2 + 5x$$

$$0 = x(x+5)$$

$$\begin{array}{l} / \\ x=0 \\ \backslash \\ x=-5 \end{array}$$

↑ not valid solution

since 2^x is the inverse of $\log_2 x$

$\log(-5+1) = \log^{-4}$ undefined
 $\log(-5+4) = \log^{-1}$ undefined

$$\therefore x=0$$