

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 7

Question 1. (5 marks) Use logarithms to evaluate:

$$\text{Let } x = \frac{(7425)^{316}}{\sqrt[3]{22.4}}$$

$$\log x = \log(7425)^{316} - \log \sqrt[3]{22.4}$$

$$\log x = 316 \log(7425) - \frac{1}{3} \log(22.4)$$

$$\log x = 1222.689998$$

$$\Rightarrow x = 10^{1222.689998} = 10^{1222} \cdot 10^{0.689998}$$

$$= 4.90 \times 10^{1222}$$

Question 2. (10 marks) Solve for x:

$$(a) 4 \log_{16}(5-x) = 1$$

$$\log_{16}(5-x) = \frac{1}{4}$$

$$16^{1/4} = 5-x$$

$$2 = 5-x$$

$$x = 5-2$$

$$x = 3$$

$$(b) \log(2x-1) + \log(x+4) = 1$$

$$\log(2x-1)(x+4) = \log 10$$

$$(2x-1)(x+4) = 10$$

$$2x^2 + 8x - x - 4 = 10$$

$$2x^2 + 7x - 14 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-7 \pm \sqrt{7^2 - 4(2)(-14)}}{2(2)}$$

$$= \frac{-7 \pm \sqrt{161}}{4} = \frac{-7 + \sqrt{161}}{4}$$