

# Math 418

Nov. 12

## Quiz 8

1.  $\log(a) = 3, 8, \log(b) = 1, 3$

$a, \log(a^2 b^3) = 2\log(a) + 3\log(b) = 7.6 + 3.9 = \boxed{11.5}$   
 $b, a/b = {}_{10}\log(a/b) = {}_{10}\log(a) - \log(b) = {}_{10}^{3.8-1.3} = \boxed{{}_{10}^{2.5}}$

2. find intercept of  $x^2 + y^2 = 1$  and  $3x - 1 = y$

$x^2 + (3x - 1)^2 = 1 \rightarrow x^2 + (3x - 1)(3x - 1) = 1 \rightarrow 9x^2 - 6x + 1 + x^2 = 1 \rightarrow 10x^2 - 6x + 1 = 1 \rightarrow 10x^2 - 6x = 0 \rightarrow x(10x - 6) = 0 \rightarrow 2x(5x - 3) = 0 \rightarrow x = 0, \frac{3}{5}$

$\frac{6 \pm \sqrt{36 - 0}}{20} = \frac{6 \pm 6}{20} \rightarrow x = 0, \frac{3}{5}$

$(0)^2 + (3(0) - 1)^2 = 1 \rightarrow 0 + 1 = 1$

$\frac{3}{5}^2 + \left(\frac{3}{5} \cdot \frac{3}{5} + \frac{6}{5}\right)^2 = \frac{14}{5} \cdot \frac{14}{5} = \frac{196}{25} + \frac{36}{25} = \frac{232}{25} = \frac{41}{5}$

3.  $\log_3(t - 4) + \log_3(t) = 2 \rightarrow \log_3(t(t - 4)) = 2$

$\log_3(t^2 - 4t) = 2 \rightarrow 3^2 = t^2 - 4t \rightarrow 9 = t^2 - 4t \rightarrow t^2 - 4t - 9, a = 1, b = -4, c = -9$   
 $\frac{4 \pm \sqrt{16 - 4(1)(-9)}}{2} \rightarrow \frac{4 \pm \sqrt{54}}{2} = t$

$(0, 1)$   
 $\left(\frac{3}{5}, \frac{4}{5}\right)$   
 $\frac{3}{5}, \frac{4}{5}$