## Algebra 3 Assignment # 9

(1) Use a calculator to solve each of the following correct to 4 decimal places please.

- (a)  $5^x = 20$  (b)  $4^{3x+1} = 9^{1-x}$
- (c)  $\log_3(18) = x$  (d)  $\log_7(x) = 1.432$
- (e)  $\ln(x) = 1.432$  (f)  $5^{\log_3(x)} = 11$
- (g)  $0.3^{x} > 7$  (h)  $2(\ln(x))^{2} 5\ln(x) 3 = 0$

(2) Let  $\log_{10}(2) = p$  and  $\log_{10}(3) = q$ . Evaluate each of the following in terms of p and q.

- (a)  $\log_{10}(6)$  (b)  $\log_{10}(72)$ (c)  $\log_{10}\left(\frac{3\sqrt{3}}{\sqrt[5]{16}}\right)$  (d)  $\log_{10}(90)$ (e)  $\log_{10}(0.5)$  (f)  $\log_{10}(5)$
- (3) Simplify the following expression please.

$$\log_4(125) \cdot \log_{49}(32) \cdot \log_{25}(7)$$

(4) The magnitude of an earthquake is measured using the Richter scale;

$$M = \frac{2}{3} \log \left( \frac{E}{10^{4.4}} \right),$$

Where M is the magnitude of the earthquake, and E is the seismic energy released by the earthquake (in joules). The 1989 San Francisco earthquake released approximately  $1.12 \times 10^{15}$  joules. Calculate the magnitude of the earthquake using the Richter scale. How much energy would be released (in joules) by an earthquake which measures 8.3 on the Richter scale?

## Algebra 3 Assignment # 9 Answers

(1)	<b>(a)</b> 1.8614	<b>(b)</b> 0.1276
	(c) 2.6309	( <b>d</b> ) 16.2248
	<b>(e)</b> 4.1871	( <b>f</b> ) 5.1388
	<b>(g)</b> x < −1.6162	(h) 0.6065, 20.0855

(2) (a) 
$$p + q$$
 (b)  $3p + 2q$ 

(c) 
$$\frac{3}{2}q - \frac{4}{5}p$$
 (d)  $2q+1$ 

(e) 
$$-p$$
 (f)  $1-p$ 

## (3) $\frac{15}{8}$

## (4) 7.1, 7.079 x $10^{16}$ joules