Full name ______________________________
ID number ______________________________

Read and follow the directions.

1. (4 points) Solve the following system and give your answer as an ordered pair (x, y).

$$x + y = 6$$
$$4x - 2y = 2$$

Solution. Using elimination, we add 2 times the first equation to second equation as follows:

$$\begin{array}{r} 2x + 2y = 12 \\ +\ 4x\ -\ 2y = \ \ 2 \\ \hline 6x + 0y = 14 \end{array}$$

Since $6x = 14$, we have that $x = \frac{7}{3}$. Using the first equation with this information we find that $\frac{7}{3} + y = 6 \implies y = \frac{11}{3}$.

2. (3 points) Solve the following exponential equation.

$$3^x = 21$$

$$\ln(3^x) = \ln(21) \implies x\ln(3) = \ln(21) \implies x = \frac{\ln(21)}{\ln(3)}$$

3. (3 points) Solve the following logarithmic equation.

$$\log_5(8 - 7x) = \log_5(x)$$

$$8 - 7x = x \implies 8 = 8x \implies x = 1$$

Checking this answer, we see that $\log_5(8 - 7) = \log_5(1)$, so it is correct and there are no domain issues.

Total: ______/10

4. (0 points) Draw your favorite part of summer, to celebrate finishing your last quiz.

USEFUL FORMULAS

- $m = \frac{y_2 - y_1}{x_2 - x_1}$
- $y = mx + b$
- $Ax + By = C$
- $y - y_1 = m(x - x_1)$
- $a^2 - b^2 = (a+b)(a-b)$
- $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$
- $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$
- $(a+b)^2 = a^2 + 2ab + b^2$
- $(a-b)^2 = a^2 - 2ab + b^2$
- $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
- $(x-h)^2 + (y-k)^2 = r^2$
- $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- $I = Prt$
- $A = P + Prt$
- $a^2 + b^2 = c^2$
- $\frac{f(x+h) - f(x)}{h}$
- $d = rt$
- $f(x) = a(x-h)^2 + k$
- $\left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$
- $a^m a^n = a^{m+n}$
- $a^0 = 1$
- $\frac{a^m}{a^n} = a^{m-n}$
- $(a^m)^n = a^{m \cdot n}$
- $(ab)^m = a^m b^m$
- $\frac{1}{a^n} = a^{-n}$
- $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, (b \neq 0)$
- $i = \sqrt{-1}$
- $i^2 = -1$
- $\log_a MN = \log_a M + \log_a N$
- $\log_a \frac{M}{N} = \log_a M - \log_a N$
- $\log_a M^p = p \log_a M$
- $\log_b M = \frac{\log_a M}{\log_a b}$
- $\log_a a = 1, \quad \log_a 1 = 0$
- $\log_a a^x = x, \quad a^{\log_a x} = x$