Imię i nazwisko:
Klasa:
Grupa 1
Wynik:

Question 1 ***(1 pt)***
$\log_{\sqrt{3}} \frac{1}{9} =$

A. 4 B. -4 C. $\frac{1}{4}$ D. $-\frac{1}{4}$

Question 2 ***(1 pt)***
If $\log_x 7 = \frac{1}{2}$, then:

A. $x = 49$ B. $x = \sqrt{7}$ C. $x = \dfrac{1}{7}$ D. $x = \dfrac{\sqrt{7}}{7}$

Question 3 ***(1 pt)***
If $\log x - \log y = 3$, then:

A. $xy = 10$ B. $\dfrac{x}{y} = 3$ C. $\dfrac{x}{y} = 1000$ D. $\dfrac{x}{y} = 3^{10}$

Question 4 ***(1 pt)***
If $2^{x+3} = 4^{x-1}$, then

A. $x = 1$ B. $x = \frac{5}{3}$ C. $x = 5$ D. $x \in \emptyset$

Question 5 ***(1 pt)***
Which of the following expressions is undefined:

A. $\log_7 \frac{1}{2}$ B. $\log_3(-5)^2$ C. $\log_{|-4|} 3$ D. $\log_1 2$

Question 6 ***(2 pts)***

Solve the equation:

$$\left(\frac{1}{3}\right)^{x+2} = 81^{3x-1}$$

Question 7 ***(4 pts)***

Find the median and the interquartile range of the following numbers:

$$\log_2 8, \quad \log_{17} 1, \quad \log_\pi \pi^3, \quad \log_7 \frac{1}{7}, \quad 2^{\log_2 5}, \quad \log 2 + \log 5, \quad \log_4 2, \quad 13^{\log_7 1}$$

Question 8 ***(3 pts)***

If $\log_a x = 3$ and $\log_a y = 5$, calculate

a) $\log_a \sqrt{\dfrac{y^3}{ax}}$

b) $\log_x \dfrac{(xy^2)^3}{a}$

Question 9 ***(3 pts)***

Solve

$$3^{2x+1} = 7$$

giving your answer correct to 2 decimal places.

Question 9 ***(3 pts)***

Solve the following system of equations:

$$\begin{cases} \log_5 x^2 + \log_5 y = 0 \\ \log_5 x^5 + \log_5 \sqrt{y} = 2 \end{cases}$$

Extra question

Use the substitution $u = \sqrt{9x+1}$ to solve:

$$\log\left(3^{\sqrt{9x+1}} - 5^{2-\sqrt{9x+1}}\right) - 2 = \frac{1}{5}\log 32 - \sqrt{x + \frac{1}{9}}\log 125$$