EXPONENTIAL :

1) CONDITION BASED EVALUATION OF EXPO EXPRESSIONS :

2007 Q1 *

(1) If $2^x \cdot 4^y = 32$ and $\frac{3^x}{9^y} = 3$, then $\frac{5^x}{125^y} = \boxed{}$.

2012 Q1 *

(2) If $\frac{2^x - 2^{-x}}{2^x + 2^{-x}} = \frac{1}{3}$, then $x = \boxed{}$.

2) EXPO AS FUNCTIONS (MAXIMUM AND MINIMUM°

2012 Q2 ***

2. Take a point $P(a, e^{-a})$ $(a > -1)$ on the curve $C : y = e^{-x}$. Let $S(a)$ be the area of the triangle surrounded by the tangent line to C at P, the x-axis and the y-axis.

(1) Find the function $S(a)$.

2014 Q3 **

3. Consider the function $y = 8^x - 9 \cdot 4^x + 15 \cdot 2^x$ of x $(-\infty < x < \infty)$. Fill in the blanks with the answers to the following questions.

(1) Let X denote 2^x. Express y in terms of X.

(2) Calculate the local maximum and minimum of y, and the values of X in (1) at which y attains them.

(3) Calculate the global maximum and minimum of y in the interval $0 \leq x \leq \log_2 7$, and the values of x at which y attains them.

(1) $y = \boxed{}$.

(2) The local maximum is $\boxed{①}$ at $X = \boxed{②}$;

the local minimum is $\boxed{③}$ at $X = \boxed{④}$.

(3) The global maximum is $\boxed{①}$ at $x = \boxed{②}$;

the global minimum is $\boxed{③}$ at $x = \boxed{④}$.

3) EXPO AS EQUATIONS :

(2) The real-number solution to the equation $2^{x+2} - 2^{-x} + 3 = 0$ is

$x = \boxed{}$.

LOGARITHMS :

1) EVALUATION OF LOG EXPRESSIONS :

2007 Q1 *

(3) $4\log_2\sqrt{2} - \frac{1}{2}\log_2 3 + \log_2\frac{\sqrt{3}}{2} = \boxed{}$.

2012 Q1 **

(1) If $k = \dfrac{\log_7 9}{\log_7 4}$, then $2^{5k} = \boxed{}$.

2013 Q1 *

(5) If $3^x = 2^y = 5$, then $\dfrac{1}{x} + \dfrac{1}{y} = \log_5 \boxed{}$.

2015 Q1 *

(3) If $y = \log_2(x + \sqrt{x^2+1})$, then $2^y - 2^{-y} = \boxed{}\, x$.

2017 Q1 *

(1) $\log_{10}\dfrac{4}{5} + 2\log_{10} 5\sqrt{5} = \boxed{}$.

2020 Q1 **

(1) The largest one among natural numbers that are less than

$$\log_2 3 \cdot \log_3 4 \cdot \log_4 5 \cdot \cdots \cdot \log_{2019} 2020$$

is $\boxed{}$.

2) LOGARITHM AND INEQUALITIES :

2008 Q1 *

(3) The solution of the inequality $\log_2(x+1) \leq 3$ is $\{ \boxed{①} < x \leq \boxed{②} \}$.

2014 Q1 *

(4) The solution to the inequality $\log_2 x + \log_2(x-2) < 4\log_{16} 8$, in the set of real numbers, is $\boxed{①} < x < \boxed{②}$.

3) LOGARITHMS AND EQUATIONS :

2015 Q1 **

(1) If the equation $\log_{10}(ax)\log_{10}(bx) + 1 = 0$ with $a > 0,\ b > 0$ constants has a solution $x > 0$, it follows that $\frac{b}{a} \geq \boxed{①}$ or $\boxed{②} \geq \frac{b}{a} > \boxed{③}$.

2016 Q1 *

(1) If $\log_3 6 - \log_9 x = \frac{1}{2}$, then $x = \boxed{}$.

4) LOGARITHMS AS FUNCTIONS :

2010 Q7 *** partial presence only

2015 Q1 **

(4) The function $f(x) = \log_2(\log_3(\log_2(\log_3(\log_2 x))))$ has the interval

$x >$ $\boxed{}$ as its maximum domain on real numbers.

5) FINDING THE NUMBER OF DIGITS AND LEADING DIGIT :

2019 Q1 **

(6) By $\log_{10} 2 \approx 0.3010$ and $\log_{10} 3 \approx 0.4771$, the number of digits of 6^{100} is $\boxed{①}$, and its leading digit is $\boxed{②}$.

6) OTHER TYPES OF LOG EXERCISES :

2020 Q1 **

(1) The largest one among natural numbers that are less than

$$\log_2 3 \cdot \log_3 4 \cdot \log_4 5 \cdot \cdots \cdot \log_{2019} 2020$$

is $\boxed{}$.

Level 1:No uknown variables, straigtforward answer, mobilizes one concept at once*

Level 2:Inclusion of unknown variables which calls for more analysis, various condition, domains rahter than specific answers,mobilizes two to three concepts at once **

Level N:When the concept has partial presence***

Logarithms and exponentials have more presence than trigonometry, there was no presence of expo as inequalities, might appear next year,?