MTHS 100

DOUBLE TUTORIAL 10

1 First Hour

Question 1. Which functions from the list below are exponential or logarithmic? If it is an exponential or a logarithmic function, what is its base?

(a) $y = x^2$,

(b) $y = 2^x$,

(c) $y = \log_4 x$,

(d) $y = \log_{10} x$,

(e) $y = 10^x$,

(f) $y = x^{10}$.

Question 2. Solve the following equations for x.

(a) $\log_2 x = 3$,

(b) $\log_3 x = 1$,

(c) $\log_{10} x = -3$,

(d) $\log_4 x = \frac{3}{2}$.

Question 3. Solve the equation for x.

(a) $10^x = 2$,

(b) $10^x = 10$,

(c) $10^x = 125$.

Question 4. Evaluate the following logarithms using the formula

$$\log_a x = \frac{\log_{10} x}{\log_{10} a}$$

and a calculator.

(a) $\log_3 45$,

(b) $\log_5 0.01$.

Question 5. Which of the functions are increasing/decreasing?

(a) $y = 2^x$,

(b) $y = \left(\frac{1}{2}\right)^x$,

(c) $y = 1.1^x$,

(d) 0.99^x.

Second Hour

Question 1. Consider a fair die, whose faces are numbered 1, 2, 3, 4, 5, 6. What is the probability of throwing a number greater than two?

(a) What is the set of all possible outcomes? We call this set the sample space.

(b) How many elementary events are contained in the sample set?

(c) What is the set of desired outcomes?

(d) What is the number of the elements in the set of desired outcomes?

(e) What is the probability of throwing a number greater than two?

Question 2. Consider a fair die. We roll the die twice and evaluate the sum.

(a) Sketch the tree diagram.

(b) What is the number of the elements in the sample space?

(c) What is the number of the events of the sum being greater than or equal to 10?

(d) What is the probability of throwing a sum greater than or equal to 10?

Question 3. Which of the following numbers can be a value of a probability?

(a) 50%,

(b) 0,

(c) 0.01,

(d) 110%,

(e) $-\frac{1}{2}$,

(f) $\frac{2}{3}$,

(g) $\frac{3}{2}$,

(h) 100%.