

LAGOS CITY POLYTECHNIC, IKEJA
SCHOOL OF MANAGEMENT AND BUSINESS STUDIES
DEPARTMENT OF GENERAL STUDIES
2016/2017 SEMESTER EXAMINATION

COURSE TITLE:	FUNCTIONS AND GEOMETRY	NO OF QUESTIONS : 6
COURSE CODE:	MTH 112	TIME ALLOWED: 2HRS
FOR WHOM:	ND YR I CS, CE, EE PT	INSTRUCTIONS: ATTEMPT FOUR
ANY		

QUESTIONS.

1. (a) (i) Show that $g(x) = 4x^3$ is a one-to-one function
(ii) Show that the function $f(x) = x^3$ is not one-to-one
(b) (i) Find the distance between the points (3, 2) and (4, 1)
(ii) With the aid of diagram explain the distance between two point.

2. (a) Explain the point of division
(b) find the coordinates of the point $p(x, y)$ which divide the segment of the line from $A(x_1, y_1)$ to $B(x_2, y_2)$ such that $AP = r$
PE
If $A(4, 3), B(1, 4), r = \frac{2}{3}$

3. (a) Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a function defined by $f(x) = (x + 7)$ show that f is onto
(b) Find the coordinates of the point $p(x, y)$ which divides the segment of the line from $A(x_1, y_1)$ to $B(x_2, y_2)$ such that $AP = r$
PE
If $A(0, 3), B(7, 4), r = \frac{2}{7}$

4. (a) Let f be a mapping define on \mathbb{R} , the set of real numbers by $f(x) = \begin{cases} x^2 & 0 \leq x \leq 1 \\ 2 & x > 1 \end{cases}$
If $A = [x: \frac{1}{4} < x < 5]$. Find $f(A)$, the Domain and range of f .
(b) Given that the point $P(9, 2)$ divides the segment of the line from $A(6, 8)$ to $B(x_2, y_2)$ in the ratio $AP: PB = 3:7$, find the coordinates of B .

5. (a) Find the gradient of the line joining the point $A(3, 1)$ to point $B(4, 2)$
(b) A relation R on the set of real number is defined by $R(x, y): X y = 2x^3$
 x^3
Is this relation a function? Justify your answer. What is the range of this relation

6. Let $f: A \rightarrow B$ be a function which have an inverse $f^{-1}: B \rightarrow A$. State two properties of the the function f : suppose $F = \{-1, 1\}$ and define a function f by $f(x) = \sin(x)$ ($\forall x \in \mathbb{R}$, the set of real numbers show that f has an inverse F^{-1} and find the formula that defines it.