

SUB-Math

Holiday work For January 2013

1. (a) Solve the equation below

$$\log_4 x - \log_4 7 = \frac{3}{2}$$

- (b) Solve the following simultaneous equation

$$\log x - \log 2 = 2 \log y$$

$$x - 5y + 2 = 0$$

2. (a) Differentiate:

(i) $x^2(4x - 2)$

(ii) $\frac{2x^3 - x^2}{3x}$

- (b) Find the equation of the tangent and normal to the curve $y = x^2(x - 3)$ at the point where it cuts the x -axis.

- (c) Sketch the curve

3. (a) The expression $6x^2 + x + 7$ leaves the same remainder when divided by $x - a$ and by $x + 2a$, where $a \neq 0$. Calculate the value of a .

- (b) The expression $b + ax - 4x^2 + 8x^3$ gives a remainder of -19 when divided by $(x + 1)$ and a remainder of 2 when divided by $(2x - 1)$.

Find the values of a & b .

4. A bag contains 4 red marbles and 6 black marbles. A marble is picked at random from the bag and not replaced. A second marble is the picked. Find the probability that:

- (i) The second marble is red given that the first marble is red.
(ii) Both marbles are red.
(iii) The marbles are of different colours.

The table below shows the diameter of trees from the school compound of Gayaza High School in *cm*.

Diameter	x	f	fx
5 - 9			21
10 - 14	12		144
15 - 19		3	
20 - 24			22
25 - 29	27	2	
30 - 34		5	
		$\sum f =$	$\sum fx =$

- (a) Study the table above and use the information available to complete the missing details.
- (b) (i) State the class width of the diameter.
(ii) Calculate the average diameter.