

KATIKAMU SECONDARY SCHOOL

B.O.T TERM TWO 2018

S.2 MATHEMATICS

Attempt all questions

Time: 2 hours 30 minutes

1. The operation $*$ is defined as $a * b = \frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{a} - \frac{1}{b}}$. Find the value of $2 * 3$
(4 marks)
2. Use the prime factors of 2744 to evaluate $\sqrt[3]{2744}$.
(4 marks)
3. Solve the inequality $\frac{x+3}{3} - \frac{x+2}{2} < \frac{x+4}{4}$
(4 marks)
4. Express $\frac{\sqrt{5}+2}{\sqrt{5}-2}$ in the form $a + b\sqrt{c}$. Hence state the values of a , b and c .
(4 marks)
5. Express 5.3636... as a mixed fraction in its simplest form. (04 marks)
6. Find the highest Common factor 12, 15 and 18. (04 marks)
7. In a class of 52 pupils, 44 passed a history test and 36 passed a chemistry test. All pupils passed at least one test. How many pupils passed both tests?
(04 marks)
8. Simplify: $\left(\frac{2\frac{4}{5} + 1\frac{1}{4}}{3\frac{3}{5}}\right) - \frac{5}{16}$
(04 marks)
9. Factorize completely $x^2 - 4xy + x - 4y$.
(04 marks)
10. Solve for a in the equation $2(a^2 + 4a + 4) = 5 + a$. (04 marks)

SECTION B

Attempt five questions

11. Three ships A, B and C are such that B is 120 km from A on a bearing of 060° . The bearing of C from A is 150° and the bearing of C from B is 170° . Calculate

- (i) The distance between A and C
- (ii) The distance between B and C
- (iii) The bearing of ship A from ship C. (12 marks)

12. A sports club has 80 members. For the three activities Swimming (S), Cycling (C) and Weight lifting (W), 8 members take part in all three activities, 3 members do not take part in any of the three activities, 22 members take part in only S, 23 members take part in S and C, 19 members take part in S and W, 14 members take part in C and W, x members take part in only W. The number of members who take part in only Cycling is twice the number of members who take part in only Weight lifting

- (i) Draw a Venn diagram to show all of the above information.
- (ii) Determine the value of x .

- (iii) Determine $[S \cap (W \cup C)]$
- (iv) A member of the club is chosen at random, what is the probability that he takes part in at least 2 activities.
- 13.(a) Show that $\sqrt{18} + \sqrt{50} - \sqrt{72} = 2\sqrt{2}$ (4 marks)
- (b) Simplify: $\frac{1}{(\sqrt{3} + \sqrt{2})} + \frac{1}{(\sqrt{3} - \sqrt{2})}$ (4 marks)
- (c) Brian won Shs 42 million in a rotary. He shared the money with his friend Samuel in the ratio 5:2 respectively. How much money did he give to Samuel. (4 marks)
14. (a) Mary is five years younger than John and Peter is twice as old as Mary. The sum of their age is 49. Find Peter's age. (4 marks)
- (b) Evaluate $x^2 - y^2$ hence calculate $\frac{25^2 - 15^2}{\sqrt{(41^2 - 40^2)}}$. (4 marks)
- (c) Factorise $(x+4)^2 - (x-3)^2$ completely. (4 marks)
- 15 (a) A rectangle has its length doubling its width. If the perimeter of the rectangle is 36cm. find the;
- (i) Width
- (ii) Length
- (iii) length of the diagonal and area of rectangle. (06 marks)
- (b) Moses picks apples for 4 consecutive days from his garden. Each day, he picks twice the number of the previous day. If the total number of apples picked for the 4 days was 1200, find the number of apples picked on the second day. (06 marks)

End. Welcsome back.