Student's name.....

1. (a) When a number N = 0. 735 $\overline{45}$ written in fraction, how is the denominator exceed the numerator? (4marks)

$N = 0.735\overline{45}$ But $0.735\overline{45} = 0.73545\overline{45}$

$N = 0.73545\overline{45}$

$N \times 100 = 0.73545\overline{45} \times 100$

$100N = 73.545\overline{45}$

$100N - N = 73.545\overline{45} - 0.735\overline{45}$

$99N = 72.81$

$N = \frac{72.81}{99} \times \frac{100}{100}$

$N = \frac{7281}{9900}$

$N = \frac{89}{1100}$

Then $1100 - 89 = 1011$.

It exceed by 1011

(b) A man spends $\frac{1}{3}$ of his income on food; $\frac{2}{5}$ of his income on clothes. If he still has TSH 4000 left with him, find his income. (6marks)

Fraction Spent on food $= \frac{1}{3}$

Fraction spent on clothes $= \frac{2}{5}$

Total fraction $= \frac{1}{3} + \frac{2}{5}$

$= \frac{11}{15}$

Fraction remained $= 1 - \frac{11}{15}$

$= \frac{4}{15}$

Then $4000 = \frac{4}{15}$

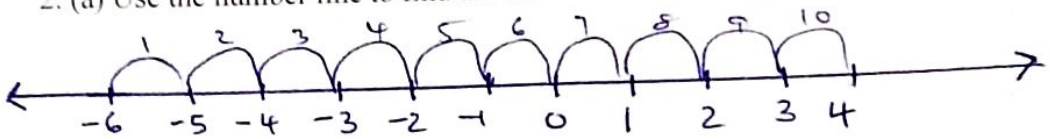
$x = \frac{15}{15}$

$x = \frac{4000 \times 15}{4}$

$x = 15000$

His income is 15000/=

2. (a) Use the number line to find the distance between -6 and 4 (6 marks)



∴ The distance is 10

(b) The average number of tomatoes in heap is 28. The number of tomatoes varies by three. What is the maximum number of oranges can be in a heap? {4marks)

The maximum number = 28 + 3 = 31 tomatoes.

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(iii) Rational numbers..... $-5, -3.5, 0, \frac{3}{4}, 4.25$ and 9

(iv) Irrational numbers..... $\frac{\sqrt{2}}{2}, \sqrt{3}, \sqrt{5}$, and π

5(a) State why mathematics is important in daily life. (6 marks)

(i) In Financial Management:

(ii) In Time management:

(iii) In Problem-Solving skills:

Other Points

1. ⇒ Proffession and occupation

2. ⇒ Food and Nutrition

(b) Express 14. 8345 to; (4marks)

(i) Nearest whole number ..... $14.8345 \approx 15$

(ii) 4 significant figures ..... $14.8345 \approx 14.83$

(iii) 3 decimal places ..... $14.8345 \approx 14.834$

(iv) Nearest tens..... $14.8345 \approx 10$

6 (a) Musa, Josephine, Mary and Kato have 300,100,500 and 600 shares in a cooperative shop respectively Divide 150,000Tshs among them in the ratio of their shares (5 marks)

Musa : Josephine : Mary : Kato $= 300 : 100 : 500 : 600$

$= 3 : 1 : 5 : 6$

Total ratio $= 3+1+5+6$

$= 15$

Musa

$\frac{3}{15} \times 150{,}000 = 30{,}000/=$

Josepline

$\frac{1}{15} \times 150{,}000 = 10{,}000/=$

Mary

$\frac{5}{15} \times 150{,}000 = 50{,}000/=$

Kato: $\frac{6}{15} \times 150{,}000$

$= 60{,}000/$

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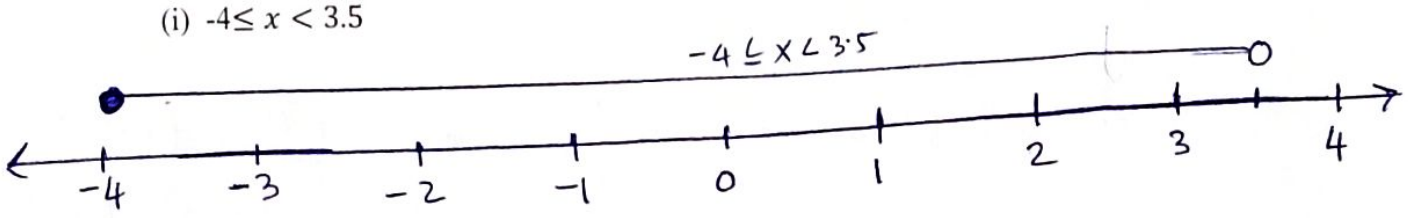
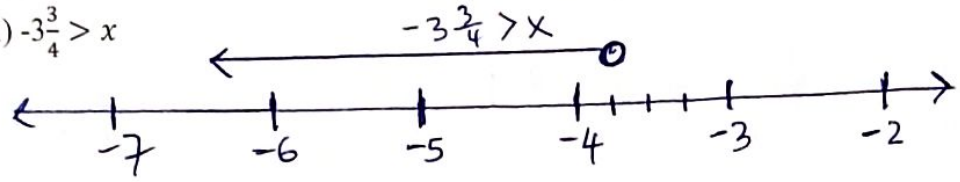
3. (a) Draw the number line to represent the following inequalities (5marks)

(i) $-4 \leq x < 3.5$



(ii) $-3\frac{3}{4} > x$



(b) The ratio of boys to girls in a class is 3:5. Find the number of girls if that of boys is 240 (5marks)

Boys Girls Boys Girls

$3 : 5 = 250 : x$

$\frac{3}{5} = \frac{240}{x}$

$3x = 5 \times 250$

$x = \frac{5 \times 240}{3}$

$x = 400$

∴ Number of girls is 400

4. (a) Give the difference between Rational and Irrational numbers (2marks)

Rational numbers are numbers which can be written in the form of $\frac{a}{b}$ where 'a' and 'b' are integers but $b \neq 0$ while Irrational numbers are numbers which when conkerted in decimals do not repeat and ~~term~~ do not terminate.

(b) Given the numbers $-5, -3.5, 0, {}^{3}/_{4}, \sqrt{3}, \sqrt{5}, 9, 4.\dot{2}\dot{5}, \pi, \frac{\sqrt{2}}{2}$. (8marks)

List the numbers which are

(i) Whole numbers..... 0 and 9 .....

(ii) Integers..... -5, 0 and 9 .....

.....

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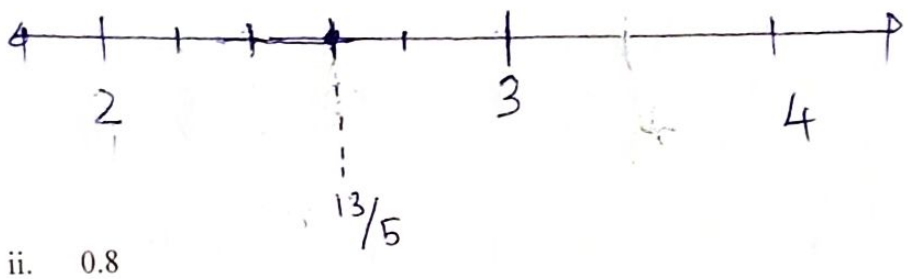
Musa got 30 000/=, Josephine got 10,000/=, Mary got 50,000/= and Kato got 60,000/=

(b) Represent the following rational numbers on the number line (5 marks)

i. $\frac{13}{5}$



ii. 0.8



7. Explain the relationship between mathematics and the following subject. (10marks)

a) Biology – In determination of animal weight, nutritive values of fruits and transpiration need calculation – Measuring of pressure, body temperature and counting Sex chromosomes need mathematical knowledge – Estimation of number of blood cells need calculation

b) Literature Mathematics is applied:- determination of number of words per sentence, number of sentence per paragraph, number of paragraph per page

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c) Geography Mathematics is applied in determination of distance from one place to another. Finding gradients, altitudes of hills and mountains

d) Business studies Mathematics is applied to determine
- Profit and Loss
- Prices of items
- Condition for loan borrowing

e) Physics
- Physics laws, principles and theorems are expressed mathematically through formulas.
- All quantities in physics are expressed in numbers and units which need concept and skills of mathematics.

8 (a) Study the following number line and use inequality symbols to answer the questions follows;. (6 marks)



(i)Write all real numbers (x) which are greater than zero

$x > 0$

(ii)Write all real numbers (x) which do not exceed 2

$x \leq 2$

(iii) Write all real numbers (x) between -3 and 4

$-3 < x < 4$

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(b) A shopkeeper sold 192 T-shirts at a price of 5,950Tshs each .By estimation, how much money did the shopkeeper get? (4 marks)

Number of T-shirts are 192.

Price of 1 T-shirts is 5950.

Amount of money $= 192 \times 5950$

$\approx 200 \times 6000$

$= 1200000$

∴ The shopkeeper got 1,200,000Tsh.

9(a) Find the absolute value of the following expression. (4marks)

$(7\frac{5}{8} + 3\frac{1}{4}) - (2\frac{2}{5} + 4\frac{1}{2})$

$\left|(7\frac{5}{8} + 3\frac{1}{4}) - (2\frac{2}{5} + 4\frac{1}{2})\right| = \left|\left(\frac{61}{8} + \frac{13}{4}\right) - \left(\frac{12}{5} + \frac{9}{2}\right)\right|$

$= \left|\frac{87}{8} - \frac{69}{10}\right|$

$= \left|\frac{435 - 276}{40}\right|$

$= \left|\frac{159}{40}\right|$

$= \frac{159}{40}$

(b) Mwajuma has $\frac{1}{3}$ of a chocolate bar .She decides to share it equally among her 5 friends . How much chocolates will each friend get? Write your answer in (4marks)

(i) Fraction

Fraction of a chocolate $= \frac{1}{3}$

Number of people to share the chocolate $= 5$

Fraction got by 1 person $= \frac{1}{3} \div 5$

$= \frac{1}{3} \times \frac{1}{5}$

$= \frac{1}{15}$

∴ Each friend will get $\frac{1}{15}$ of the chocolate.

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(ii)Decimal

$\frac{1}{15} = 15\overline{)100}$ $0.0666\ldots = 0.0\dot{6}$

$\begin{array}{r} 100 \\ 90 \\ \hline 100 \\ 90 \end{array}$

$\therefore$ Each friend will get $0.0\dot{6}$ of the chocolate.

(c) Find the irrational number (X) such that $x^2 = 11$ (2marks)

$X^2 = 11$

$\sqrt{X^2} = \sqrt{11}$.

$\therefore X = \sqrt{11}$.

10. (a) The base of a lid of bucket has an area of $\frac{25}{484}\pi\ m^2$.Find its diameter in decimals (5marks)

Area $(A) = \frac{\pi d^2}{4}$

$4A = \pi d^2$

$\frac{4A}{\pi} = d^2$

$\sqrt{\frac{4A}{\pi}} = \sqrt{d^2}$

$d = \sqrt{\frac{4A}{\pi}}$ but $A = \frac{25\pi}{484}$

$d = \sqrt{\frac{4 \times \frac{25\pi}{484}}{\pi}}$

$d = \sqrt{\frac{100\pi}{484\pi}}$

$d = \sqrt{\frac{100}{484}} = \sqrt{\frac{25}{121}} = \frac{5}{11}$

$= 0.454545\ldots$

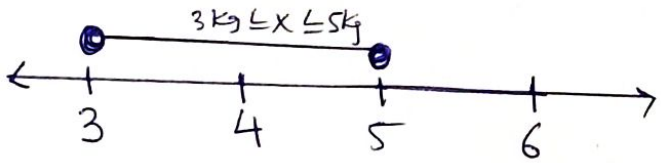
$= 0.\dot{4}\dot{5}$

(b)Represent each of the following information on a number line (5marks)

(i)The expected mass of a human at birth is at least 3kg and less than 5kg

let x be the mass of human at birth

$3kg \leq X < 5kg$



(ii)The mass of students in a class is at most 50kg and not less than 35kg

let x be the mass of student.

$35kg \leq X \leq 50kg$

