THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

FORM TWO NATIONAL ASSESSMENT

041 BASIC MATHEMATICS

Duration: 2:30 Hour **SOLUTIONS** **Year: 2025**

Instructions

1. This paper consists of sections A, B and C with a total of **ten (10)** questions.
2. Answer **all** questions in the spaces provided.
3. Section A carry and C **fifteen (15)** marks each and section B carries **seventy (70)** marks.
4. Show clearly all the working and answers in the space provided
5. All writing must be in **blue** or **black** ink.
6. NECTA mathematical tables, geometric instruments and graph papers may be used where necessary.
7. Communication devices and any unauthorised materials are **not** allowed in the examination room.
8. Write your **Assessment Number** on every page of your answer booklet(s).

FOR ASSESSOR'S USE ONLY		
QUESTION NUMBER	**SCORE**	**ASSESSOR'S INITIALS**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		
CHECKER'S SIGNATURE		

1. (a) Evaluate 1/5 of ((50 ÷ 5 + 5) − (8 × 4 − 2))

Solution

USING BODMAS

50 ÷ 5 = 10
10 + 5 = 15

8 × 4 = 32
32 − 2 = 30

(50 ÷ 5 + 5) − (8 × 4 − 2)
= 15 − 30
= −15

1/5 of −15
= −15 ÷ 5 = −3
Answer: −3

(b) The population of three towns are 65600, 13400 and 29700 to the nearest hundreds. Approximate the total population of the three towns to the nearest thousands.

Solution

Round each to the nearest hundred first

65600 ≈ 65600

13400 ≈ 13400

29700 ≈ 29700

Total population

= 65600 + 13400 + 29700 = 108700

Round to the nearest thousand

108700 ≈ 109000

Answer: 109000

2. (a) In a family of 15 children, 2/5 of them drink tea and 1/3 of them drink coffee. How many children drink none of the two drinks?

Solution

Number who drink tea
= 2/5 × 15
= 6

Number who drink coffee
= 1/3 × 15
= 5

Assuming no child drinks both tea and coffee

Total who drink tea or coffee
= 6 + 5
= 11

Number who drink none
= 15 − 11
= 4

Answer: 4 children

(b) In a class of 40 students, 25 students passed English Language assessment. Find the percentage of students who failed the assessment.

Solution

Number who failed
= 40 − 25
= 15

Percentage who failed
= (15 ÷ 40) × 100
= 37.5%

Answer: 37.5%

3. (a) A textbook was bought at shs 8500 and then sold at shs 6000. Calculate the percentage loss.

Solution

Loss
= 8500 − 6000
= 2500

Percentage loss
= (2500 ÷ 8500) × 100
= 29.41%

Answer: 29.41%

(b) Four families A, B, C and D have to share 33 kilograms of meat in the ratio 4 : 5 : 6 : 7 respectively
(i) What is the largest share?
(ii) Which family will get the largest share?

Solution

Total ratio
= 4 + 5 + 6 + 7
= 22

Value of one part
= 33 ÷ 22
= 1.5 kg

Shares
A = 4 × 1.5 = 6 kg
B = 5 × 1.5 = 7.5 kg

C = 6 × 1.5 = 9 kg

D = 7 × 1.5 = 10.5 kg

(i) Largest share = 10.5 kg

(ii) Family D gets the largest share

4. (a) In the following figure AB is parallel to PQ and RS is a transversal. Find the angles marked a, b, w, x, y and z.

Answer

a = 60 degrees

b + 60 degrees = 180 degrees
b = 120 degrees

w = b = 120 degrees

x = a = 60 degrees

y = 120 degrees

z + 120 degrees = 180 degrees
z = 60 degrees

(b) The perimeter of triangle ABC is 16 cm. If AB = (5 + x) cm, AC = (2 + x) cm and BC = 5 cm, find the value of x and hence the actual lengths of AB and AC.

Solution

Perimeter
= AB + AC + BC

16 = (5 + x) + (2 + x) + 5

$16 = 12 + 2x$

$2x = 4$

$x = 2$

Lengths

$AB = 5 + 2 = 7$ cm

$AC = 2 + 2 = 4$ cm

Answer: x = 2, AB = 7 cm, AC = 4 cm

5. (a) Simplify the following expressions

(i) $7m - 2(5n - 4m) + 11n - 5m$

Solution

$7m - 10n + 8m + 11n - 5m$
$= (7m + 8m - 5m) + (-10n + 11n)$
$= 10m + n$

Answer: $10m + n$

(ii) $(5x - 2y) - 2(4x - 3y)$

Solution

$5x - 2y - 8x + 6y$
$= -3x + 4y$

Answer: $-3x + 4y$

(b) The sum of two numbers is 19 and their difference is 5. Find the numbers.

Solution

Let the numbers be a and b

$a + b = 19$

$a - b = 5$

Add the equations

$2a = 24$

$a = 12$

$b = 19 - 12$

$b = 7$

Answer: 12 and 7

6. (a) The gradient of the line $ky = kx + x + 7$ is 2

(i) Find the value of k

(ii) Write down its y-intercept

Solution

$ky = (k + 1)x + 7$

Divide both sides by k

$y = (k + 1)/k\ x + 7/k$

Gradient $= (k + 1)/k$

$(k + 1)/k = 2$

$k + 1 = 2k$

$k = 1$

y-intercept $= 7/k = 7$

Answer: k = 1, y-intercept = 7

(b) The graph of straight line $Kx - My - 4 = 0$ passes through the points A(−2, −5) and B(2, −3). Find the values of K and M.

Solution

Substitute A(−2, −5)

$K(-2) - M(-5) - 4 = 0$
$-2K + 5M = 4$

Substitute B(2, −3)

$2K - M(-3) - 4 = 0$
$2K + 3M = 4$

Solve simultaneously

$-2K + 5M = 4$
$2K + 3M = 4$

Add equations

$8M = 8$
$M = 1$

Substitute into $2K + 3M = 4$

$2K + 3 = 4$
$2K = 1$
$K = 1/2$

Answer: K = 1/2, M = 1

7. (a) Find the value of $8^{(-2/3)} + (3^{-2})/2^{-3}$

Solution

$8^{(-2/3)}$
$= (2^3)^{(-2/3)}$
$= 2^{(-2)}$
$= 1/4$

$3^{(-2)} = 1/9$
$2^{(-3)} = 1/8$

$(1/9) \div (1/8)$
$= 8/9$

Total
$= 1/4 + 8/9$

LCM of 4 and 9 = 36

= 9/36 + 32/36
= 41/36

Answer: 41/36

(b) Rationalize the denominator of $\sqrt{2} / (\sqrt{3} + \sqrt{2})$

Solution

Multiply numerator and denominator by $(\sqrt{3} - \sqrt{2})$

$\sqrt{2}(\sqrt{3} - \sqrt{2}) / [(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})]$

Denominator
$= 3 - 2$
$= 1$

Numerator
$= \sqrt{6} - 2$

Answer: $\sqrt{6} - 2$

8. (a) By using the following figure prove that triangle ABC is similar to triangle ABD

Angle BAC = 90^o

Angle ADB = 90^o

Angle BAC = Angle ADB

Angle ABC = Angle ABD

Therefore, triangle ABC is similar to triangle ABD

(b) In the following figure BE bisects angle DEF and DE = FE. Prove that triangle BEF is congruent to triangle BED

FE = DE

Angle FEB = Angle DEB

BE = BE

Therefore, triangle BEF is congruent to triangle BED

9. (a) Calculate the length y in the following figure. Give the correct answer to one decimal place

$\sin(70^{o}) = y / 30$

$y = 30 \times \sin(70^{o})$

$y = 30 \times 0.9397$

$y = 28.191$

$y = 28.2$

(b) A ladder on the ground leans against a vertical wall whose height is 5 metres. The ground distance between the ladder and the wall is 12 metres.

(i) Draw a diagram to represent this information.

A right angled triangle can be drawn.

The vertical wall is 5 m.

The horizontal ground distance is 12 m.

The ladder is the sloping side, which is the hypotenuse.

(ii) By using the diagram in part (b) (i) find the length of the ladder.

Using Pythagoras theorem

Length of ladder squared = 5 squared + 12 squared

= 25 + 144

= 169

Length of ladder = square root of 169

= 13 m

So, the length of the ladder is 13 metres.

10.(a) In a school of 120 students 40 learn English 60 learn Kiswahili and 30 learn both Kiswahili and English. How many students learn neither English nor Kiswahili?

Number learning English = 40

Number learning Kiswahili = 60

Number learning both = 30

Number learning at least one language

= 40 + 60 − 30

= 70

Number learning neither

= 120 − 70

= 50

So, 50 students learn neither English nor Kiswahili.

(b) The following marks were scored by students in a History test:

54 54 40 55 54 43 73 37 75 47

35 47 73 46 31 43 47 35 35 60

69 54 44 48 55 45 50 37 51 36

Construct a frequency distribution table by grouping the marks in the class intervals 30 - 39 40 - 49 50 - 59 etc. Hence find the percentage of students who scored marks ranging from 50 to 69 in the test.

Frequency distribution table

Class interval	Frequency
30 – 39	8
40 – 49	10
50 – 59	8
60 – 69	3
70 – 79	3

Total number of students = 32

Marks from 50 to 69 include classes 50 - 59 and 60 - 69

Number of students scoring 50 to 69

= 8 + 3

= 11

Percentage scoring 50 to 69

= (11 / 32) x 100

= 34.375 percent

So, the percentage of students who scored between 50 and 69 is 34.4 percent.