THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

FORM TWO NATIONAL ASSESSMENT

041 **MATHEMATICS**

(VOCATIONAL STREAM)

(For Both School and Private Students)

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

Instructions

1. This paper consists of **ten (10)** questions.
2. Answer **all** questions Show clearly all the working and answers in the space provided
3. Each question carries **ten (10)** marks.
4. NECTA mathematical tables, geometric instruments and graph papers may be used where necessary.
5. Communication devices and any unauthorised materials are **not** allowed in the examination room.
6. 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) Convert 2.13 into a fraction.

   Solution

   Let x = 2.1333333…

   Multiply both sides by 10 to move one decimal place

   10x = 21.333333…

   Subtract the first equation from this

   10x − x = 21.333333… − 2.133333…

   9x = 19.2

   x = 19.2 / 9

   Convert to a fraction

   19.2 = 192/10

   x = (192/10) ÷ 9

   x = 192 / 90

   Simplify by dividing by 6

   x = 32 / 15

   Answer: 32/15

   (b) A village has 150 people of which 80 are women and the rest are men. What is the ratio of men in the village?

   Solution

   Number of men = 150 − 80 = 70

   Ratio of men to total population

   = 70 : 150

   Divide both terms by 10

   = 7 : 15

   Answer: 7 : 15

(c) If a : b = 21 : 45, express (2a + b) : (a + 2b) in its lowest form.

Solution

Let a = 21k and b = 45k

2a + b = 2(21k) + 45k = 42k + 45k = 87k

a + 2b = 21k + 2(45k) = 21k + 90k = 111k

Ratio = 87k : 111k

= 87 : 111

Divide both by 3

= 29 : 37

Answer: 29 : 37

2. (a) How much is 136 USD worth in Tanzanian shillings if 1 USD = Tshs 2,650?

Solution

Amount in Tshs = 136 × 2650

136 × 2650 = 360400

Answer: Tshs 360,400

(b) A truck travels 600 km in 10 hours while a bus travels the same distance in 7.5 hours.

(i) Calculate the speed of each vehicle.

(ii) Which vehicle travels faster?

Solution

Speed of truck

= 600 ÷ 10

= 60 km/h

Speed of bus

= 600 ÷ 7.5

= 80 km/h

Comparison

80 km/h > 60 km/h

Answers

Truck speed = 60 km/h

Bus speed = 80 km/h

The bus travels faster.

3. (a) (i) Subtract 35.4 from 234 and give the answer to the nearest hundreds.

Solution

234 − 35.4 = 198.6

Nearest hundred = 200

Answer: 200

(ii) Estimate the cost of 27 kg of meat sold at Tshs 8150 per kilogram.

Solution

Estimate 27 ≈ 30

8150 ≈ 8000

Estimated cost

= 30 × 8000

= 240,000

Answer: Approximately Tshs 240,000

(b) A vehicle consumes 1.13 litres of fuel to cover a distance of 11.65 km.

(i) Estimate the rate of fuel consumption in km per litre.

(ii) Estimate the amount of fuel used to travel 35.78 km.

Solution

Round values

$1.13 \approx 1.1$ litres

$11.65 \approx 11.7$ km

Rate

$= 11.7 \div 1.1$

≈ 10.6 km per litre

Fuel for 35.78 km

Round $35.78 \approx 36$ km

Fuel used

$= 36 \div 10.6$

≈ 3.4 litres

Answers

Rate ≈ 10.6 km per litre

Fuel ≈ 3.4 litres

4. (a) Find the value of y in the given figure.

Solution

From the figure,

AB ‖ DC

EG ‖ DC

AC is a transversal

y = angle at G

angle at G = 70°

y = 70°

(b) Triangle ABC is similar to triangle PQR. Find the value of x.

ABC ~ PQR

BC / QR = AB / PQ

6 / 4 = (x − 3) / 2

6 × 2 = 4(x − 3)

12 = 4x − 12

4x = 24

x = 6

5. (a) Write each of the following numbers in standard form.

(i) 29814

(ii) 0.0136

Solution

$29814 = 2.9814 \times 10^4$

$0.0136 = 1.36 \times 10^{-2}$

Answers

(i) 2.9814×10^4

(ii) 1.36×10^{-2}

(b) Given that log 2 = 0.3010, log 3 = 0.4771 and log 5 = 0.6990, find log 90.

Solution

$90 = 9 \times 10$

$= 3^2 \times 10$

$\log 90 = \log 9 + \log 10$

$= 2 \log 3 + 1$

$= 2(0.4771) + 1$

$= 0.9542 + 1$

$= 1.9542$

Answer: 1.9542

6. (a) Solve the inequality $(2x + 8) / -3 < 20$

Solution

Multiply both sides by -3 and reverse the inequality sign

$2x + 8 > -60$

$2x > -68$

$x > -34$

Answer: $x > -34$

(b) Solve the simultaneous equations by elimination

$a + 2b = 1$

$3a - 4b = 8$

Solution

Multiply first equation by 2

$2a + 4b = 2$

Add to second equation

$3a - 4b$

$+2a + 4b$

$= 8 + 2$

$5a = 10$

$a = 2$

Substitute into $a + 2b = 1$

$2 + 2b = 1$

$2b = -1$

$b = -0.5$

Answer: a = 2, b = −0.5

7. (a) How many subsets does each of the following sets contain?

   (i) A = {a, b, c}

   (ii) B = {1, 2, 3, 4}

Solution

Number of subsets = 2^n

For A, n = 3

$2^3 = 8$

For B, n = 4

$2^4 = 16$

Answers

(i) 8

(ii) 16

(b) Given U = {1,2,3,4,5,6,7,8,9,10},

P = {1,2,3,4,5,6} and Q = {5,6,7,8}.

Find

(i) $P' \cap Q$

(ii) $P' \cup Q'$

Solution

$P' = \{7,8,9,10\}$

$Q' = \{1,2,3,4,9,10\}$

(i) $P' \cap Q$

= {7,8}

(ii) $P' \cup Q'$

= {1,2,3,4,7,8,9,10}

8. (a) Draw Venn diagrams and shade the regions representing

   (i) $X \cap Y$

   (ii) X is a subset of Y

   (b) In a meeting, 40 people drank water, 70 drank soda and 35 drank both. Assuming everyone drank water or soda, find the total number of people.

   Solution

   Total = W + S − both

   = 40 + 70 − 35

   = 75

   Answer: 75 people

9. (a) Find the gradient of a straight line passing through A (1,3) and B (4,5).

Solution

Gradient = (5 − 3) / (4 − 1)

= 2 / 3

Answer: 2/3

(b) Solve graphically

$2x + y = -5$

$-x + y = -2$

Solution

Subtract second from first

$3x = -3$

$x = -1$

Substitute into $-x + y = -2$

$1 + y = -2$

$y = -3$

Answer: x = −1, y = −3

10.(a) Use $\sin \theta = 4/5$ to find $\cos \theta$ and $\tan \theta$.

Solution

Opposite = 4

Hypotenuse = 5

Adjacent = $\sqrt{(5^2 - 4^2)}$

= $\sqrt{(25 - 16)}$

= 3

cos θ = 3/5

tan θ = 4/3

(ii) Find the value of x in the given figure, leave the answer in surd form.

Solution

This cannot be solved because the figure is not provided.

(b) A painter needs to reach a point 4 m high on a wall using a ladder of length 4.5 m. Find the angle of elevation with the horizontal, correct to one decimal place.

Solution

sin θ = opposite / hypotenuse

= 4 / 4.5

sin θ = 0.8889

$\theta = \sin^{-1}(0.8889)$

$\theta \approx 62.7^{o}$

Answer: 62.7^{o}