



Dr. Bbosa Science

UGANDA NATIONAL EXAMINATION BOARD

PRIMARY LEAVING EXAMINATION

1992 guide

MATHEMATICS

Turnover

SECTION A

1. Multiply : 3×154

$$\begin{array}{r} 154 \\ \times 3 \\ \hline 462 \end{array}$$

2. Write XXIV in Hindu Arabic numerals.

$$XXIV = XX + IV$$

$$= 20 + 4 = 24$$

3. Simplify: $-7 - 4$.

$$-7 - 4 = -7 + 4 = -3$$

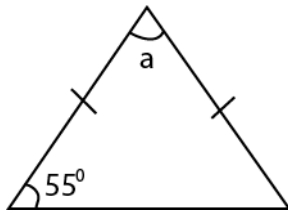
4. Give that $A =$ (multiples of 7 less than 20), write down all the possible members of A.

$$A = (7, 14)$$

5. How many times does 205 go into 2050?

$$\frac{2050}{205} = 10$$

6. In the diagram below, what is angle a?



$$55^\circ + 55^\circ + a = 180^\circ$$

$$110^\circ + a = 180^\circ$$

$$110^\circ - 110^\circ + a = 180^\circ - 110^\circ$$

$$a = 70^\circ$$

7. Express 240 as a fraction of 4800 in the simplest term.

$$\frac{240}{4800} = \frac{24}{480} = \frac{1}{20}$$

8. Solve: $y + 3 = -2y$

Collect like terms

$$y + 2y = 3$$

$$3y = 3$$

Divide by 3 throughout

$$y = 1$$

9. Subtract $1101_{\text{two}} - 110_{\text{two}}$.

1101_{two}

-110_{two}

111_{two}

Or

First change the numbers to base ten, subtract the numbers and then change the answer to base two.

$$1101_{\text{two}} = (1 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0) = 13$$

$$-110_{\text{two}} = (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) = -6$$

$$= 7_{\text{ten}}$$

Converting 7_{ten} to base two

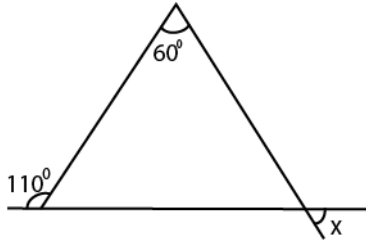
$$\begin{array}{r|l} 2 & 7 \\ \hline 2 & 3 \\ \hline 2 & 1 \\ \hline & 0 \end{array} \begin{array}{l} R \\ 1 \\ 1 \\ 1 \end{array}$$

$$\text{Hence, } 1101_{\text{two}} - 110_{\text{two}} = 111_{\text{two}}$$

10. Find the perimeter of a square garden of sides 10 metres.

$$\text{Perimeter of a square} = \text{side} \times 4 = 10 \times 4 = 40\text{m}$$

11. In the diagram below, find the size of angle x



Solution

$$60^\circ + x = 110^\circ$$

$$60^\circ - 60^\circ + x = 110^\circ - 60^\circ$$

$$x = 50^\circ$$

12. If the cost of 6 kilograms of meat is shs4200, what is the cost of 4 kilograms?

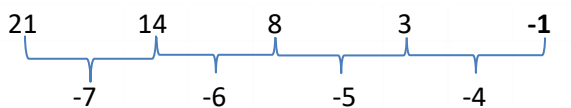
Solution

6kg cost Shs 4200

$$1 \text{ kg costs shs } \frac{4200}{6} = \text{Shs}700$$

$$4 \text{ kg} = \text{Shs } 700 \times 4 = \text{Shs } 2,800$$

13. What is the next number in the sequence: 21, 14, 8, 3,...



14. If $x = 4$, $y = 6$ and $z = 3$ find the value of $\frac{1}{2^x} \times \frac{z}{y}$

Substitution

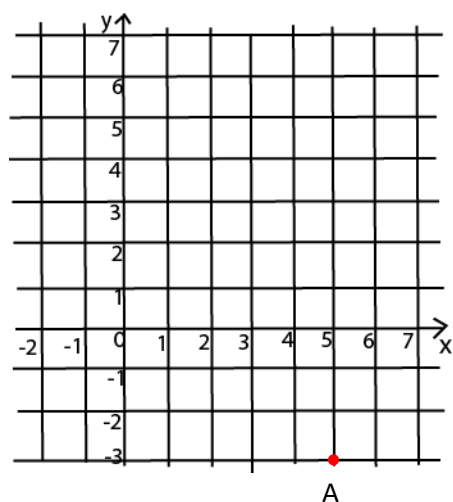
$$\frac{1}{2^4} \times \frac{3}{6} = \frac{1}{2 \times 2 \times 2 \times 2} \times \frac{3}{6} = \frac{3}{2 \times 2 \times 2 \times 2 \times 3} = \frac{1}{32}$$

15. Musa walked for $1\frac{1}{2}$ hours at an average speed of 4 km per hour. What distance did he cover?

Solution

$$\text{Distance covered} = \text{Speed} \times \text{time} = 4 \times 1\frac{1}{2} = 4 \times \frac{3}{2} = 6 \text{ km}$$

16. On the grid below mark a point A whose coordinates are (5, -3).



17. Multiply 0.32×0.2 .

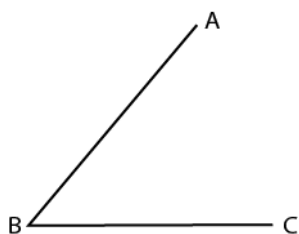
Solution

0.32

$\times 0.2$

0.064

18. Without using a protractor, bisect angle ABC, in the diagram below.



Fix the compass at B

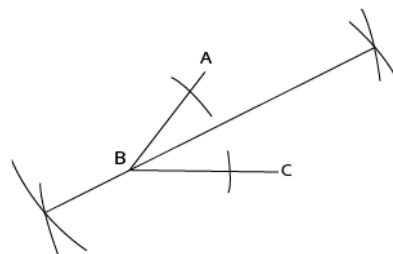
Adjust the compass and make two arcs between BC and BA respectively.

Remove the compass and at each of the arcs made above and draw new arcs between A and C and behind B.

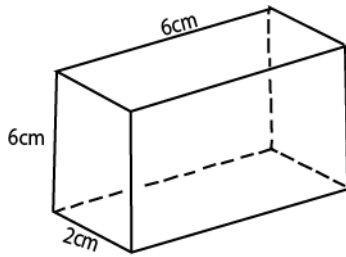
Draw a line from B through the intersection of arcs drawn above.

The line drawn is the bisector of angle ABC

Solution



19. Find the area of the base of cuboid below.



Solution

Area = length x width

$$= 2 \times 6$$

$$= 12 \text{ cm}^2$$

20. Juma has in his pocket a bundle of five hundred shilling notes numbered in order from AH 565705 to AH565805. How many notes does he have in the pocket?

Solution

$$\text{Number of notes} = 565805 - 565705 + 1 = 101$$

21. In a class, there are 24 boys and 12 girls. If a pupil is picked at random, to sweep the class, what is the probability that the pupil picked is a girl?

$$\text{Total number of pupils} = 24 + 12 = 36$$

$$\text{Probability of a girl} = \frac{12}{36} = \frac{1}{3}$$

22. Tom is standing in a line so that he is the ninth boy from either end of the line. Find the number of boys in the line.

Solution

$$\text{Number of boys} = 8 + 8 + 1 = 17$$

Or



23. How many centimeters are in 2.658 metres?

Solution

$$1\text{meter} = 100\text{cm}$$

$$\therefore 2.658\text{m} = 2.658 \times 100 = 265.8\text{cm}$$

24. It a fund-raising occasion, a minister contributed sh. 17500 and his wife contributed sh.2500.what was their average contribution?

Solution

$$\text{Average} = \frac{\text{sum of items}}{\text{number of items}} = \frac{17500+2500}{2} = \frac{20000}{2} = 10000 =$$

25. What time is 10.00 pm on a 24 hour clock?

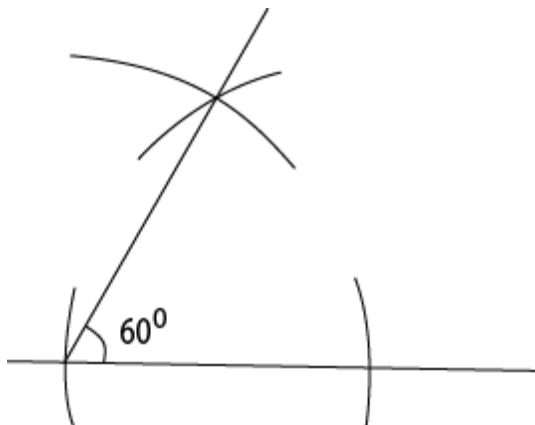
$$10.00\text{pm} = 12.00 + 10.00 = 22.00\text{hrs in 24-hour clock}$$

26. Using a ruler and a pair of compasses only, construct an angle of 60° the space provided.

Construction Steps taken

- Draw a horizontal line
- With a compass placed at one end, make an arc at one side of the line and another arc above the line.
- Remove the compass and place at the point where the arc meets the line on the other side and draw an arc at the former point and another one to cut the arc drawn above the line.
- Draw a line through the intersection of the two arcs above.

The angle between this line and the original line is 60°



27. Simplify : $\frac{36a^2b}{9ab^2}$

Solution

$$\frac{36a^2b}{9ab^2} = \frac{4a}{b}$$

28. A trader put sh. 50.000 in the bank for one year. If the interest Rate was 30%, how much money did he get as interest?

Interest, $I = PRT$

$$= 50000 \times \frac{30}{100} \times 1 = 15,000/ =$$

29. When I multiplied a number by 2, and add 7 to it, I get 13. What is the number?

Let the number be x

$$2x + 7 = 13$$

Collect like terms to one side

$$2x = 13 - 7 = 6$$

Divide by 2 throughout

$$X = 3$$

30. The sum of two numbers is 2. If one of the numbers is $\frac{2}{3}$ -, what is the other number?

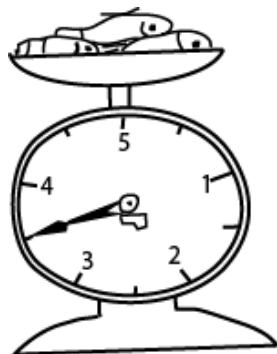
Let one number be x

$$x + \frac{2}{3} = 2$$

$$X = 2 - \frac{2}{3} = 1\frac{1}{3}$$

SECTION B

31. The picture shows a scale used to weigh fish by a fishmonger.



(a) What is the greatest mass, which can be recorded on the machine?

The scale can record a maximum of 5kg

(b) What is the mass of the three fish?

The mass of the fish = $3\frac{1}{2}$

(c) If the cost of fish is sh. 900 per kg, how much will the buyer pay for three fish?

Cost = mass x unit cost

$$= 3\frac{1}{2} \times 900 = 3150$$

(d) What is the average cost of each fish?

$$\text{Average} \frac{\text{total}}{\text{number of items}} = \frac{3150}{3} = \text{shs } 1050 \text{ per fish}$$

32. In a match factory, 50 matchsticks are packed in a matchbox, 20 matchboxes are packed in a packet. 10 packets are packed in a carton.

(a) How many sticks are there in a carton?

1 carton contain 10 packets of packets

$$= 20 \times 10$$

$$= 200 \text{ match boxes}$$

$$= 200 \times 50$$

$$= 10000 \text{ match sticks}$$

(b) If the mass of the sticks in a packet is 20gms, what is the mass of 1 stick?

$$\text{Number of sticks per packet} = 20 \times 50 = 1000$$

$$\text{Mass of one stick} = \frac{20}{1000} = 0.02g$$

33. Out of 120 students who took a test, $\frac{1}{3}$ were girls.

(a) How many girls took the test?

$$\text{Number of girls} = \frac{1}{3} \text{ of } 120 = \frac{1}{3} \times 120 = 40$$

(b) If 40 % of the boys failed and 55% of the girls passed the test, how many students altogether passed the test?

$$\text{Total number of boys } 120 - 40 = 80$$

$$\text{The percentage of boys that passed} = 100 - 40 = 60\%$$

$$\text{Number of boys that passed} = \frac{60}{100} \times 80 = 48$$

$$\text{Number of girls that passed} = \frac{55}{100} \times 40 = 22$$

$$\text{Total students that passed } 48 + 22 = 70$$

34. Akiiki is 38 years old and his son is 12 years old. At what age will Akiiki be twice as old as his son?

Let the number of years that pass be x

Akiiki's age after x years will be $38 + x$

The son's age after x years will be $12 + x$

It implies that after x years; $\frac{38+x}{12+x} = 2$

$$38 + x = 2(12 + x)$$

$$38 + x = 24 + 2x$$

Collecting like terms to one side

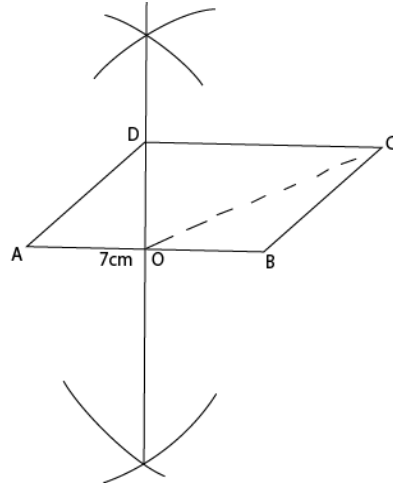
$$x = 14$$

The age of Akiiki will be $38 + 14 = 52$ years

35. Follow the instructions below and construct a parallelogram in the space provided:

Draw a horizontal line AB of length 7 cm. Draw a perpendicular bisector line AB. Mark the point O where the bisector meets line AB. Measure a length of 3 cm from O along the bisector. Mark this point D. Join point A to point D. Lines AD and AB form two sides of the parallelogram.

(a) Complete the construction of the parallelogram APCB



(b) Measure OC = 7.5cm

(c) Measure angle BOC. = 40°.

36. Peter spent $\frac{2}{3}$ of his salary on food and $\frac{1}{4}$ on transport. He saves the balance of sh.2400.

(a) Draw an accurate pie-chart to represent this information. (Take the radius of the pie chart to be 4 cm)

$$\text{Fraction of saved} = 1 - \left(\frac{2}{3} + \frac{1}{4} \right)$$

$$= 1 - \frac{8+3}{12}$$

$$= 1 - \frac{11}{12} = \frac{1}{12}$$

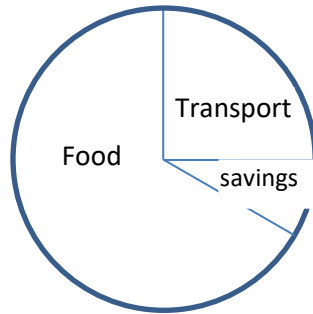
Converting to degrees

$$\text{Degrees of saved income} = \frac{1}{12} \times 360 = 30 \text{ degrees}$$

$$\text{Degrees for the income spent on food} = \frac{2}{3} \times 360 = 240^\circ$$

$$\text{Degrees for income spent of transport} = \frac{1}{4} \times 360 = 90^\circ$$

Pie chart



(b) What is Peter's total monthly earnings?

Let the salary be x

$$\frac{1}{12} x = 2400$$

$$\text{The salary} = 2400 \times 12 = 28,800 \text{ /=}$$

37. (a) Solve: $\frac{12}{x} + 2 = 6$.

$$\frac{12}{x} = 6 - 2 = 4$$

$$12 = 4x$$

$$x = 3$$

(b) Solve: $3a + 2 > a + 6$.

38. Otim buys a cow from Okello and sells it to Mukasa at sh. 40,000 making a profit of 25%. What did Otim pay to Okello?

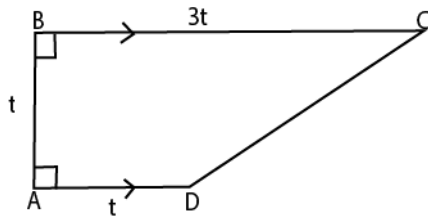
Let cost of cow to Otim be x

$$\frac{125}{100} x = 40000$$

$$x = \frac{40000 \times 100}{125} = 32000$$

∴ Otim paid shs 32000 to Okello

39. In the diagram below, ABCD: AD= t, BC=3t and AB = t. If the area of ABCD is 50 cm² find the value of t.



$$\text{Area of trapezium} = \frac{1}{2} AB \times (BC + AD)$$

$$50 = \frac{1}{2} t (t + 3t)$$

$$50 = 2t^2$$

$$t = 5$$

40. There are three classes in a school with 4, 15 and 18 pupils respectively. Find the number of mangoes that each class can share out without any remainders.

The questions requires to find the LCM of 4, 15 and 18

Expressing the number in form of prime factors

	4	15	18
2	2	15	9
2	1	15	9
3	1	5	3
3	1	5	1
5	1	1	1

$$\text{LCM} = 2 \times 2 \times 3 \times 3 \times 5 = 180 \text{ mangoes}$$

41. A closed cylindrical drum has radius 0.35m and height 1.22 m. calculate the surface area of the drum, (take $n = \frac{22}{7}$)

$$\text{Surface area of enclosed cylinder} = 2\pi r^2 + 2\pi rh$$

$$= 2 \times \frac{22}{7} \times 0.35 \times 0.35 + 2 \times \frac{22}{7} \times 0.35 \times 1.22$$

$$= 0.77 + 2.684$$

$$= 3.454\text{m}^2$$

42. In a mathematics test given to class, the marks scored are shown in the table below.

Marks scored	Frequency	Total marks
4	4	16
5	9	45
6	14	84
7	8	56
9	5	45

(a) Complete the table.

(b) What was the mode?

6 (appears most)

(c) How many pupils were in the class?

Number pupils = sum of frequencies

$$= 4 + 9 + 14 + 8 + 5$$

$$= 40$$

(d) What was the average mark scored?

$$\text{Average} = \frac{\text{sum of items}}{\text{total number}} = \frac{16+45+84+56+45}{40} = 6.15$$

END