GTLE ONLINE TEST

MATHEMATICS CONTENT (JHS)

SIR EKON AND HIS TEAM

FOR GOD AND MOTHER GHANA

Each question is followed by FOUR options lettered A – D. Circle the correct option.

QUE 1

In binary arithmetic, Calculate $1101_2 - 1101_2$

A. 101_2 B. 1011_2 C. 1101_2 D. 10101_2

QUE 2

If $A = \{x : 0 \leq x \leq 2\}$ and $B = \{y : y \text{ is a prime number}\}$, then what is $A \cap B$?

A. ϕ B. $\{1\}$ C. $\{2\}$ D. $\{1, 2\}$

QUE 3

The difference between $\frac{3}{8}$ and another number is $\frac{1}{5}$. Find the number.

A. $\frac{8}{15}$ B. $\frac{2}{3}$ C. $\frac{7}{40}$ D. $\frac{3}{40}$

QUE 4

Express 98 as a product of its prime.

A. $2^2 \times 7$

B. $2^2 \times 7^2$

C. 2×7^2

D. $2^3 \times 7$

Compiled by the King (0757158506)

QUE 5

Which of the following is an empty set?

A. $\{x : x \text{ is a rational number and } x^2 - 1 = 0\}$.

B. $\{x : x \text{ is a rational number and } x^2 - 9 = 0\}$

C. $\{x : x \text{ is a rational number and } x^2 - 4 = 0\}$.

D. None of the above

QUE 6

While visiting your ward in school, you saw on the blackboard the mathematics problem $13 + 15 = 31$. What base are they using?

A. 5 B. 7 C. 10 D. 12

QUE 7

A number whose fifth part increased by 4 is equal to its fourth part reduced by 10. Find the number

A. 210 B. 280 C. 260 D. 230

QUE 8

$m^2 - 1$ is divisible by 8, if m is ______

A. an even number
B. an odd number
C a natural number
D. a whole number

QUE 9

If a number system uses base ten, then what digits will be used to express numbers?

A. the digits 1 – 4
B. the digits 1 – 10
C the digits 0 – 9
D. the digits 0 – 5

Compiled by Sir Lewis (0541581502)

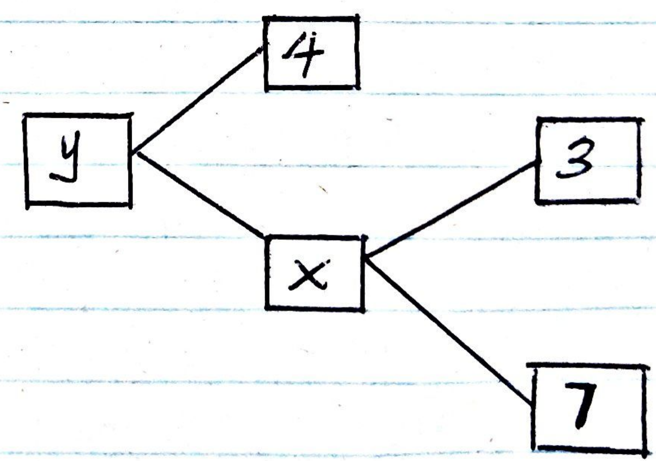
QUE 10

In a certain office, $\frac{1}{3}$ of the workers are women, $\frac{1}{2}$ of the women are married and $\frac{1}{3}$ of the married women have children. If $\frac{3}{4}$ of the men are married and $\frac{2}{3}$ of the married men have children, what part of the workers are WITHOUT children?

A. $\frac{11}{18}$ B. $\frac{7}{11}$ C. $\frac{1}{11}$ D. $\frac{5}{18}$

QUE 11

The value of x and y in the given figure are



A. $x = 10$, $y = 14$
B. $x = 21$, $y = 84$
C. $x = 21$, $y = 25$
D. $x = 10$, $y = 40$

QUE 12

Let $A = \{x : x$ is a square of a natural number and x is less than $100\}$ and B is a set of even natural numbers. What is the cardinality of $A \cap B$?

A. 4 B. 5 C. 9 D. None of the above

QUE 13

Convert octal 36 to binary.

A. 11011O B. 100110
C. 110011 D. 011110

QUE 14

The product of a rational and irrational number is ___

A. rational B. Irrational
C. All the above D. None of the above

QUE 15

Which of the following is correct?

A. $n(A \cup B) = n(A) + n(B) + n(A \cap B)$
B. $n(A \cup B) = n(A) - n(B) - n(A \cap B)$
C. $n(A \cup B) = n(A) + n(B) - n(A \cap B)$
D. $n(A \cap B) = n(A) + n(B) + n(A \cup B)$

QUE 16

$\frac{7}{9}$ of the people present in a hall are sitting in $\frac{9}{13}$ of the chairs available and the rest are standing. If there are 28 empty chairs. How many chairs would have been still empty if everyone in the hall was sitting.

A. 15 B. 12 C. 18 D. 10

QUE 17

In a class of 110 students, x students take both Mathematics and Statistics, $2x + 20$ students take Mathematics and $2x + 30$ students take Statistics. There are NO students who take neither of the two subjects. Find the value of x.

A. 15 B. 20 C. 25 D. 30

Compiled by SLK KING
(0547585502)

QUE 18

What would be the decimal value of 11111110?

A. 255 B. 254

C. 239 D. None of the above

QUE 19

The product of three consecutive positive integers is divisible by

A. 4 B. 6

C. no common factor D. only 1

QUE 20

Which of the following fractions should be added to $5/9$ to obtain $11/6$ as a the sum.

A. $1\frac{5}{18}$ B. $1\frac{3}{18}$

C. $1\frac{7}{18}$ D. $1\frac{11}{18}$

Compiled by Sir King (05471581502)

QUE 21

Convert the binary number 1011.1110 to decimal

A. 11.875 B. 11.675

C. 13.875 D. 13.75

QUE 22

Which of the following is NOT irrational?

A. $(2-\sqrt{3})2$ B. $(\sqrt{2}+\sqrt{3})2$

C. $(\sqrt{2}-\sqrt{3})(\sqrt{2}+\sqrt{3})$ D. $\frac{2\sqrt{7}}{7}$

QUE 23

If $A \cap B = A$, then find the value of $A \cup B$

A. A' B. B C. A+B D. A

QUE 24

Find the greatest among the following.

A. 0.62 B. $2/3$

C. 0.57 D. $4/5$

QUE 25

The number 102 written in binary is _____

A. 01100 11 B. 1100 11
C. 110 110 D. 1100 110

QUE 26

If A is a subset of B and B is a subset of C, then the cardinality of A ∪ B ∪ C is equal to:

A. Cardinality of C
B. Cardinality of B
C. Cardinality of A
D. None of the above

QUE 27

Joan, Siti and Xiuli had 60 beads each. Joan gave 2/5 of her beads to Xiuli. Siti gave some of her beads to Xiuli. Xiuli had 3 times the total of the remaining beads Joan and Siti had. How many beads did Siti give to Xiuli?

A. 20 B. 24 C. 51 D. 75

QUE 28

The sum of a rational and irrational number is _

A. rational B. irrational
C. All the above D. None of the above

QUE 29

If $A = \{1, 3, 4\}$ and $B = \{x : x \in R \text{ and } x^2 - 7x + 12 = 0\}$, then which of the following is true?

A. A = B B. A ⊂ B
C. B ⊂ A D. A is equivalent to B.

QUE 30

Three farmers have 490kg, 588kg and 882kg of wheat respectively. Find the maximum capacity of a bag so that the wheat can be packed in exact number of bags.

A. 98 kg B. 290 kg
C. 200 kg D. 350 kg.

GOOD LUCK !!!

Solution to online Test
MATHS CONTENT (JHS)

QUE 1

$$\begin{array}{r} 11010_2 \\ -\ 1101_2 \\ \hline 1101_2 \end{array}$$

Ans C

QUE 2

$A = \{0, 1, 2\}$

$B = \{2, 3, 5, ---\}$

$A \cap B = \{2\}$

Ans C

QUE 3

Let the no be $= x$

$$\frac{3}{8} - x = \frac{1}{5}$$

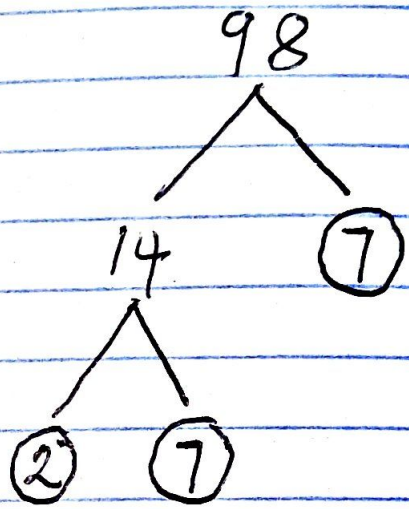
$$\frac{3}{8} - \frac{1}{5} = x$$

Ans C

$$\frac{7}{40} = x$$

$$x = 7/40$$

QUE 4



$98 = 2 \times 7 \times 7$

$98 = 2 \times 7^2$

Ans C

Compiled by the King (0547158152)

QUE 5

$x^2 - 1 = 0$

$x^2 - 1^2 = 0$

$(x-1)(x+1) = 0$

$x - 1 = 0 \mid x + 1 = 0$

$x = 1 \mid x = -1$

$A = \{x : x = -1 \text{ or } 1\}$

$x^2 - 9 = 0$

$x^2 - 3^2 = 0$

$(x-3)(x+3) = 0$

$x - 3 = 0 \mid x + 3 = 0$

$x = 3 \mid x = -3$

$B = \{x : x = -3 \text{ or } x = 3\}$.

$x^2 - 4 = 0$

$x^2 - 2^2 = 0$

$(x-2)(x+2) = 0$

$x - 2 = 0 \mid x + 2 = 0$

$x = 2 \mid x = -2$

$C = \{x : x = -2 \text{ or } 2\}$

Since, each set contains an element,

Ans D.

QUE 6

$$\begin{array}{r} 1\ \ 3_7 \\ +\ 1\ \ 5_7 \\ \hline 3\ \ 1_7 \end{array}$$

Ans B

QUE 7

Let the number $= x$

$\frac{1}{5}x + 4 = \frac{1}{4}x - 10$

Multiply each term by the l.c.m (ie 20)

$\overset{4}{\cancel{20}}\left(\frac{1}{\cancel{5}}x\right) + 20(4) = \overset{5}{\cancel{20}}\left(\frac{1}{\cancel{4}}x\right) - 20(10)$

$4x + 80 = 5x - 200$

$80 + 200 = 5x - 4x$

$280 = x$

$x = 280$

Ans B.

QUE 8

$m^2 - 1$

odd nos $\{1, 3, 5, 7, 9, 11, ---\}$

when $m = 3$

$3^2 - 1 = 9 - 1 = 8$

when $m = 5$

$5^2 - 1 = 25 - 1 = 24$

when $m = 7$

$7^2 - 1 = 49 - 1 = 48$

8, 24 and 48 are all divisible by 8.

Ans B.

QUE 9

Base ten uses ten digits

ie 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.

Ans C.

Compiled by SIR KING (0541581502)

QUE 10

let the no of workers $= y$.

No of women $= \frac{1}{3}y$

No of married women

$\frac{1}{2}$ of $\frac{1}{3}y = \frac{1}{2} \times \frac{1}{3}y = \frac{1}{6}y$.

No of married women with children

$\frac{1}{3}$ of $\frac{1}{6}y = \frac{1}{3} \times \frac{1}{6}y = \frac{1}{18}y$.

No of men

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

No of married men

$\frac{3}{4}$ of $\frac{2}{3}y = \frac{3}{4} \times \frac{2}{3}y = \frac{1}{2}y$

No of married men with children

$\frac{2}{3}$ of $\frac{1}{2}y = \frac{2}{3} \times \frac{1}{2}y = \frac{1}{3}y$

Workers with children

Married women with children + married men with children

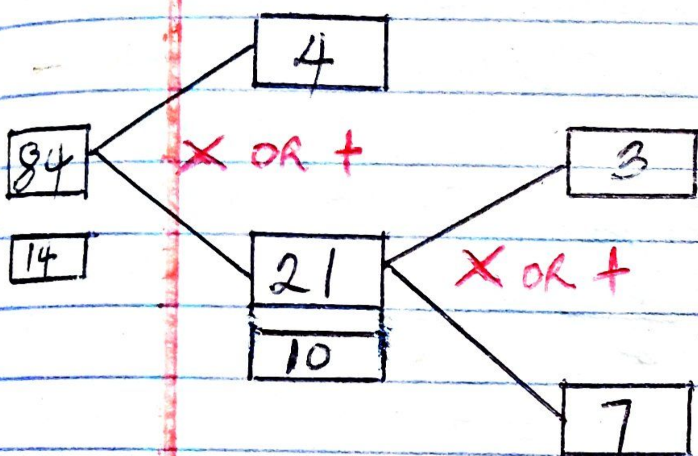
$\frac{1}{18}y + \frac{1}{3}y = \frac{7}{18}y$.

Workers without children

$y - \frac{7}{18}y = \frac{11}{18}y$

Ans A.

QUE 11



× = multiplication
+ = Addition
Ans A OR B

QUE 12

$A = \{1, 4, 9, 16, 25, 36, 49, 64, 81\}$

$B = \{2, 4, 6, 8, 10, ---\}$

$A \cap B = \{4, 16, 36, 64\}$

$n(A \cap B) = 4$

Ans A.

compiled by SIR KENG (0541581530)

QUE 13

octal 36

36_8

Convert 36_8 to a decimal numeral

$(3 \times 8^1) + (6 \times 8^0)$
$(3 \times 8) + (6 \times 1)$
$24 + 6$
30_{ten}

Convert 30_{ten} to binary

2	30	R
2	15	0
2	7	1
2	3	1
2	1	1

11110_2

Ans D

QUE 14

Rational Number × Irrational Number

$2 \times \sqrt{2}$

$2\sqrt{2}$ (Irrational number)

Ans B

QUE 15

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$

Ans C

QUE 16

Let the no of available chairs in the hall $= x$

No of occupied chairs

$\frac{9}{13}x$

No of Available chairs

$x - \frac{9}{13}x = \frac{4}{13}x$

Available chairs = empty chairs

$\frac{4}{13}x = 28$

multiply each term by the L.C.M (ie 13)

$13\left(\frac{4}{13}x\right) = 13(28)$

$\frac{4x}{4} = \frac{364}{4}$

$x = 91$

There are 91 chairs available in the hall.

Let the no of people present in the hall $= y$.

No of people sitted

$\frac{7}{9}y$.

No of chairs occupied by the people

$91 - 28 = 63$

No of people sitted = No of occupied chairs

$\frac{7}{9}y = 63$

Compiled by SIR Kenny (05/08/2025)

multiply each term by the l.c.m (ie 9)

$9\left(\frac{7}{9}y\right) = 9(63)$

$\cancel{9}\left(\frac{7}{\cancel{9}}y\right) = 9(63)$

$7y = 567$

$\frac{\cancel{7}y}{\cancel{7}} = \frac{567}{7}$

$y = 81$

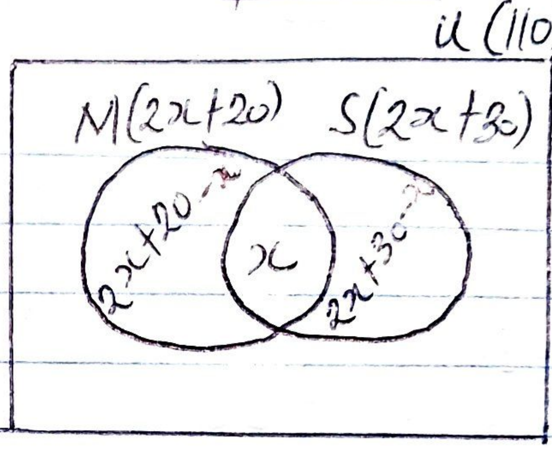
Total no of chairs = 91
Total no of people = 81

No of chairs that would have been empty if everyone in the hall was sitting

$91 - 81 = 10$

Compiled by Sir Kunly (07058151682)

QUE 17



$2x+20-x+x+2x+30-x=110$

$2x+20-\cancel{x}+\cancel{x}+2x+30-x=110$

$3x+50=110$

$3x=110-50$

$3x=60$

$\frac{\cancel{3}x}{\cancel{3}} = \frac{60}{3}$

$x = 20$

Ans B

QUE 18

7 6 5 4 3 2 1 0

11111110_2

$(1\times2^7)+(1\times2^6)+(1\times2^5)+(1\times2^4)$
$+(1\times2^3)+(1\times2^2)+(1\times2^1)+(0\times2^0)$

$(1\times128)+(1\times64)+(1\times32)+(1\times16)$
$+(1\times8)+(1\times4)+(1\times1)+(0\times1)$

$128+64+32+16+8+4+2+0$

254_{10} Ans B

QUE 19

ie $1 \times 2 \times 3 = 6$

$2 \times 3 \times 4 = 24$

$3 \times 4 \times 5 = 60$

6, 24 and 60 are all divisible by 6

ANS B.

QUE 20

Let the fraction be = K

$\frac{5}{9} + K = \frac{11}{6}$

$K = \frac{11}{6} - \frac{5}{9}$

$K = \frac{23}{18}$ OR $\frac{5}{18}$

ANS A.

Completed by Sir Kung (05+15+15+22)

QUE 21

3 2 1 0 -1 -2 -3 -4

1011.1110_2

$(1\times2^3)+(0\times2^2)+(1\times2^1)+(1\times2^0)$
$+(1\times2^{-1})+(1\times2^{-2})+(1\times2^{-3})+(0\times2^{-4})$

$(1\times8)+(0\times4)+(1\times2)+(1\times1)$
$+(1\times\frac{1}{2})+(1\times\frac{1}{4})+(1\times\frac{1}{8})+(0\times\frac{1}{16})$

$8+0+2+1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+0$

11.875

ANS A

QUE 22

$(\sqrt{2}-\sqrt{3})(\sqrt{2}+\sqrt{3})$

$2+\sqrt{6}-\sqrt{6}-3$

$2+\cancel{\sqrt{6}}-\cancel{\sqrt{6}}-3$

$2-3$

-1

ANS C

QUE 23

$A \cup B = A + B - (A \cap B)$

But $A \cap B = A$

$A \cup B = A + B - A$

$A \cup B = \cancel{A} + B - \cancel{A}$

$A \cup B = B$

Ans B

QUE 24

Convert the common fractions to decimals

$\frac{2}{3} = 0.66---$

$\frac{4}{5} = 0.88---$

0.62 and 0.57

By comparing, $0.88---(\frac{4}{5})$ is the greatest

Ans D.

13

QUE 25

102_{ten} to binary

2	102	R
2	51	0
2	25	1
2	12	1
2	6	0
2	3	0
2	1	1

1100110_2

Ans D.

QUE 26

$A = \{1\}$

$B = \{1, 2\}$

$C = \{1, 2, 3\}$

$A \cup B \cup C = \{1, 2, 3\}$

$n(A \cup B \cup C) = 3$

$n(C) = 3$

Hence, the cardinality of $A \cup B \cup C$ is equal to the cardinality of C

Ans A

QUE 27

Joan Siti Xiuli
60 beads 60 beads 60 beads

Joan gave $\frac{2}{5}$ of his beads to Xiuli

$\frac{2}{5} \times 60 = 24$ beads

Let the no of beads Siti gave to Xiuli $= x$

Remaining beads

Joan	Siti
$60 - 24$	$60 - x$
36	

No of beads Xiuli has now

$60 + 24 + x = 84 + x$

Xiuli has 3 times the total of the remaining beads Joan and Siti had

$84 + x = 3[(36) + (60 - x)]$
$84 + x = 3(36 + 60 - x)$
$84 + x = 3(96 - x)$
$84 + x = 288 - 3x$
$x + 3x = 288 - 84$
$4x = 204$
$\frac{4x}{4} = \frac{204}{4}$
$x = 51$

Ans C

QUE 28

ie $2 + \sqrt{2} = 2 + \sqrt{2}$
rational irrational irrational

Ans B

QUE 29

$A = \{1, 3, 4\}$.

$x^2 - 7x + 12 = 0$
$(x-4)(x-3) = 0$
$x - 4 = 0$ | $x - 3 = 0$
$x = 4$ | $x = 3$

$B = \{3, 4\}$

B is a subset of A
$B \subset A$

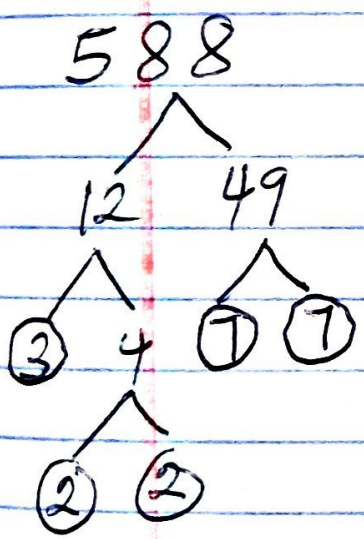
Ans C

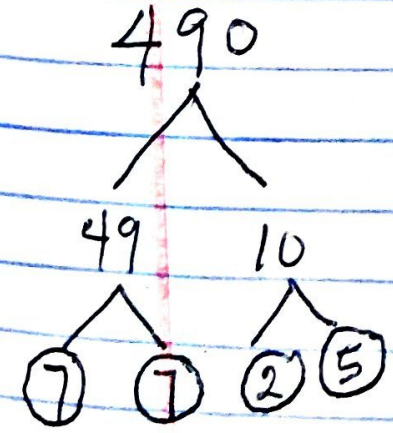
QUE 30

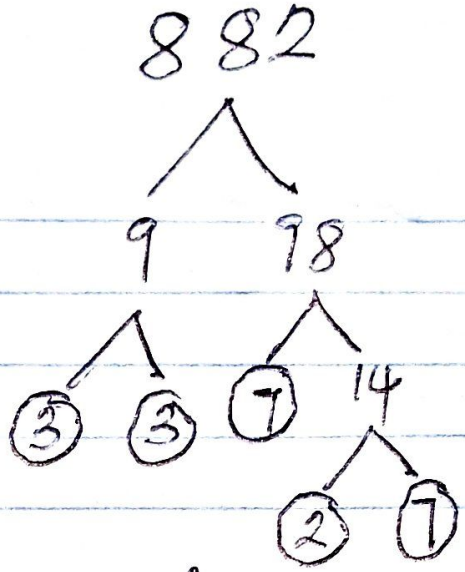
Find the HCF of

490kg, 588kg

and 882kg







$588 = 2^2 \times 3 \times 7^2$

$490 = 2 \times 5 \times 7^2$

$882 = 2 \times 3^2 \times 7^2$

$HCF = 2 \times 7^2$

$= 2 \times 49 = 98kg.$

Ans A.

Compiled by Sir Ikins (0547158152)

OBJECTIVES

1 C	11 A or B	21 A
2 C	12 A	22 C
3 C	13 D	23 B
4 C	14 B	24 D
5 D	15 C	25 D
6 B	16 D	26 A
7 B	17 B	27 C
8 B	18 B	28 B
9 C	19 B	29 C
10 A	20 A	30 A