KITH AND KIN INTERNATIONAL COLLEGE

*7/11 Kaoli Olusanya Street, Owode Ibeshe, Ikorodu, Lagos State.*

THIRD TERM EXAMINATION 2024/2025 ACADEMIC SESSION



|  |  |
| --- | --- |
| **NAME** |  |
| **SUBJECT** |  **MATHEMATICS** | **CLASS** | **SS 2** | **DURATION** | **2½ HOURS** |

**THEORY**

**(100 Marks)**

**INSTRUCTIONS**

1. **Write your name in the space provided at the top of this question.**
2. **This paper is divided into two Parts: A and B.**
3. **Answer 10 questions; all in Part A, and five questions from Part B.**

**PART A**

 **Attempt all questions in this part.**

1. (a) Without using tables or calculator, simplify $\frac{0.6 × 32 × 0.004}{1.2 ×0.008 × 0.16} $, leaving the answer in standard form

 (scientific notation).

 (b) Simplify :$3\sqrt{75}-\sqrt{12}+ \sqrt{108}$  , leaving the answer in surd form (radicals).

 **WAEC 2014/1** **(8 marks)**

1. A carpenter was told to make a rectangular desk with top of dimension 50 cm by 40 cm. The

 carpenter actually made the desk 60 cm by 35 cm.

1. Calculate the percentage error in the;
2. length and the breadth
3. area of the table top.
4. Find the product of the two errors in (a)(i) **WAEC 1990/4 (8 marks)**
5. (a) The graph of $y=2px^{2}-p^{2}x-14$ passes through the point$ \left(3,10\right)$**.** Find the values of$ p$.

 (b) Two lines, $3y -2x=21$ and $4y+5x=5$ intersect at the point$ Q$. Find the coordinates of $Q$.

 ***NECO* 2018/2 (8 marks)**

 4. A boy 1.2m tall, stands 6m away from the foot of a vertical lamp pole 4.2m long. If the lamp is at the

 tip of the pole,

 (a) represent this information in a diagram ;

 (b) calculate the (i) length of the shadow of the boy cast by the lamp ; (ii) angle of elevation of the lamp

 from the boy, correct to the nearest degree. **WAEC 2013/5 (8 marks)**

 5.



 In the diagram above, P, Q , R, and S are points on the circle with centre K. KR is a bisector of angle

 ∠SRQ, ∠KSP $=41°$ , and ∠SKR $=80°$.

 (a) Find: ∠RQP;

 (b) Find ∠SPQ **WAEC 2023/5 (8 marks)**

**PART B**

***Attempt five [5] questions only in this part****.*

 6. PQ is a tangent to a circle RST at the point S. PRT is a straight line, < TPS = 34° and < TSQ = 65°.

 (a) Illustrate the information in a diagram;

 (b)  find the value of : (i) < RTS ; (ii) < SRP.



 (c) In the diagram, /VZ/ = /YZ/, < YXZ = 20° and < ZVY = 52°. Calculate the size of < WYZ.

 **WAEC 2017/8 (12 marks)**

 7. A boy stands at the point M on the same horizontal level as the foot, T of a vertical building. He observes

 an object on the top, P of the building at an angle of elevation of 66°. He moves directly backward to a

 new point C and observes the same object at an angle of 53°. if | MT | = 50 m:

1. Illustrate the information in a diagram;
2. (i) Calculate and correct to one decimal place: the height of the building;

 (ii) Calculate and correct to one decimal place: LINE MC. ***WAEC* 2023/5**

1. The product of two consecutive positive numbers is 195. By constructing a quadratic equation and

 solving It, find the two numbers. **WAEC 1995/7 (12 marks)**

 8. (a) The height, h m, of a dock above sea level is given by $h=6+4\cos(\left(15p\right))°,0<p<6$**.**

 Find :

 (i) the value of $h$ when $p=4$ ; (ii) correct to two significant figures, the value of $p$ when $h=9m$.

 (b) Determine the value of $x$ for which the following expression is undefined ;

 $\frac{7}{5x} - \frac{3x - 4}{6x^{2} - 3x + 30} + \frac{x^{2}+ 5}{64 - 4x^{2}}$ **WAEC 2015/4 (12 marks)**

 9. (a) The probabilities that three boys pass an examination are $\frac{2}{3} $, $\frac{5}{8}$ and $\frac{3}{4}$ respectively. Find the

 probability that :

 (i) all three boys pass ; (ii) none of the boys pass ; (iii) only two of the boys pass. **WAEC 2001/9**

 (b) Given the points $P\left(3,5\right)$ and $Q\left(-5,7\right)$ on the Cartesian plane such that $R\left(x,y\right)$ is the midpoint

 of $PQ$, find the equation of the line that passes through $R$ and perpendicular to line $PQ$.

 **WAEC 1993/4 (12 marks)**

 10. The table shows the marks scored by some candidates in an examination.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks (%) | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-99 |
| Frequency | 7 | 11 | 17 | 20 | 29 | 34 | 30 | 25 | 21 | 6 |

 (a) Construct a cumulative frequency table for the distribution and draw a cumulative frequency curve.

 (b) Use the curve to estimate, correct to one decimal place, the :

 (i) Lowest mark for distinction if 5% of the candidates passed with distinction ;

 (ii) probability of selecting a candidate who scored at most 45%.

 **NECO 2015/10 (12 marks)**

 11. (a) Y is 60 km away from X on a bearing of 135°. Z is 80 km away from X on a bearing of 225°. Find the :

 (i) distance of Z from Y ;

 (ii) bearing of Z from Y. **WAEC 2007/4**

1. (i) The sum of the second and third terms of a geometric progression is six times the fourth term.

Find the two possible values of the common ratio.

 (ii) If the second term is 8 and the common ratio is positive, find the first six terms.

 **NECO 2008/13 (12 marks)**

 12. (a) Copy and complete the table of values for $y=3sinx+2cosx $**for** $0°\leq x\leq 360°$

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | $$0°$$ | $$60°$$ | $$120°$$ | $$180°$$ | $$240°$$ | $$300°$$ | $$360°$$ |
| $$y$$ | $$2.00$$ |  |  |  |  |  | $$2.00$$ |

(b) Using a scale of 2 cm to 60° on x- axis and 2 cm to 1 unit on the y- axis, draw the graph of

$y=3sinx+2cosx$**for**$0°\leq x\leq 360°$

 (c) Use your graph to solve the equation : $3sinx+2cosx=1.5$**.**

 (d) Find the range of values of x for which $3sinx+2cosx<-1$**. WAEC 2008/12 (12 marks)**

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**OBJECTIVE TEST**

**(50 marks)**

Answer **all** questions

 *Each* question is followed by *four* options lettered **A** to **D**. Choose the correct option for ***each*** question and *shade in* ***pencil*** on your answer sheet the answer space that bears the same letter as the option you have chosen. Give only one answer to each question and erase completely any answer you wish to change. Do **all** rough work on this question paper.

1. If $log\_{10}2=m$ and $log\_{10}3=n$, find the $log\_{10}24$ in terms of $m$ and $n.$
	1. 3$m+n$
	2. $m+3n$
	3. 4$mn$
	4. 3$mn$
2. If $log$ 2 $= $0.3010 and $log 2^{y}=$ 1.8062, find correct to the nearest whole number, the value of $y$.
	1. 6
	2. 5
	3. 4
	4. $-5$
3. A student found the approximate value of 0.02548 correct to two decimal places instead on two significant figures. Find the percentage error.
	1. $ 0 \%$
	2. $ 13\frac{1}{3}\%$
	3. $ 16\frac{2}{3}\%$
	4. $ 20 \%$
4. Two buses start from the same station at 9:00 am, and travel in opposite directions along the same straight road. The first bus travels at a speed of 72 km/h and the second at 48 km/h. At what time will they be 240 km apart?
	1. 1:00 pm
	2. 12:00 noon
	3. 11:00am
	4. 10:00 am
5. The nth term of a sequence is

Tn = 5 + (n - 1)2. Evaluate T4 - T6

* 1. $30$
	2. $16$
	3. $-16$
	4. $-30$
1. If Olu, Tony and Tunde share ₦240 000.00 in the ratio 2 : 3 : 5 respectively, what is two-thirds of Tunde’s share?
	1. ₦120 000.00
	2. ₦80 000.00
	3. ₦72 000.00
	4. ₦48 000.00



 From the graph determine the roots of the

 equation $y=2x^{2}+x-6$

A.$ -3$ , 4

B.  $-2$,$ 1.5$

C. $ -1$, $1$

D.  2, 1.5

1. If twice a certain integer is subtracted from 5 times the integer, the result is 63. Find the integer.
	1. 35
	2. 21
	3. 4
	4. 3
2. Simplify $\frac{1}{ x - 3} - \frac{\left( x - 1\right)}{x^{2}- 9}$
3. $\frac{x-1}{x - 3}$
4. $\frac{2 }{x + 3}$
5. $\frac{x - 1}{x + 3}$
6. $\frac{4x}{x^{3 }- 9}$
7. The ratio of the number of men to the number of women in a 20-member committee is 3 : 1. How many women must be added to the 20-member committee so as to make the ratio of men to women 3 : 2?
	1. 2
	2. 5
	3. 7
	4. 9
8. If the 2nd and 5th terms of a G.P are 6 and 48 respectively, find the sum of the first four terms.
	1. $-15$
	2. 15
	3. 33
	4. 45
9. A ladder 9 m long leans against a vertical wall, making an angle of 64$°$ with the horizontal ground. Calculate correct to one decimal place, how far the foot of ladder is from the wall.

 A. 4.0 m

 B. 5.8 m

 C. 7.1 m

 D. 8.1 m

1. Factorize $5y^{2}+2ay-3a^{2}$
	1. $\left(5y-a\right)\left(y+3a\right)$
	2. $\left(5y+a\right)\left(y-3a\right)$
	3. $\left(y-a\right)\left(5y+3a\right)$
	4. $\left(y+a\right)\left(5y-3a\right)$
2. If $\frac{3^{(1-n)}}{9^{-2n}} = \frac{1}{9}$ find $n$
	1. $-\frac{3}{2}$
	2. $ \frac{1}{3}$
	3. $-1$
	4. $-3$
3. Given that $4P4\_{5}=119\_{10}$ , find the value $P.$

 A. 1

 B. 2

 C. 3

 D. 4



 In the diagram above, O is the center

 of the circle. If ∠POR = 114o,

 calculate ∠PQR

A.  134o

B.  123o

C.  117o

D.  114o

18. Evaluate $\left(101.2\right)^{2}-\left(100.5\right)^{2}$

 A. 1

 B. 202

 C. 20.02

 D. 2.02

19. If $\sin(θ=k, )$ find $\tan(θ), 0°\leq θ\leq 90°$

* 1. $1-k$
	2. $\frac{k}{\sqrt{ 1 - k^{2}}}$
	3. $\frac{k}{1-k }$
	4. $\frac{k}{k - 1}$
1. $ cos x $is negative and $\sin(x)$ is

$ $ negative. Which of the following is

 true of $x?$

 A. $90°<θ<180°$

 B. $180°<θ<270°$

 C.$ 270°<θ<360°$

 D. $0°<θ<90°$

1. The fourth term of an exponential

 sequence is 192 and its ninth term is

 6. Find the common ratio of the

 sequence.

* 1. $ \frac{1}{3} $
	2. $ \frac{1}{2}$
	3. 2
	4. 3
1. Given that $-6$,$ 2\frac{1}{2} $,… 71 is linear

 sequence, calculate the number of

 the terms in the sequence.

 A. 20

 B. 23

 C. 22

 D. 21

1. The expression $\frac{5x+3}{6x\left(x+1\right)}$ will be

 undefined when $x$ equals

* 1. $ \left(0, 1\right)$
	2. $\left(0, -1\right)$
	3. $ \left(-3, -1\right)$
	4. $ \left(-3, 0\right)$
1. The 1st term of a geometric progression (G.P) is $ \frac{3}{4}$ , if the product of the 2nd and 3rd terms of the sequence is 972, find its common ratio.
2. 3
3. 12
4. 36
5. 45

25. Simplify $\frac{2x^{2}-5x-12}{4x^{2}-9}$

 A. $ \frac{x + 4}{2x + 3}$

 B. $\frac{x - 4}{2x - 3}$

 C. $ \frac{x - 4}{2x + 3}$

 D. $\frac{x + 4}{2x - 3}$

26. If $x^{2}+15x+50=a^{2 }+bx+c=0.$

 Which of the following statements is

 not true?

 A. $ x= -5$

 B. $ bc =750$

 C. $ x+10=0$

 D. $ x=10$

27. Given that $\left(2x+7\right)$ is a factor of $ 2x^{2}+3x-14 $, find the other factor.

 A. $ x+2$

 B. $ x-2$

 C. $ 2-x$

 D. $ x+1$

28. If $\frac{4m+3n}{4m-3n}= \frac{5}{2}$ , Find the ratio of $m:n$

1. 4 : 3
2. 7 : 4
3. 3 : 4
4. 4 : 7

29. Factorize $6x^{2}+7x-20$

 A. $ \left(6x-5\right)\left(x+4\right)$

 B. $\left(3x-4\right)\left(2x+5\right)$

 C. $\left(3x+4\right)\left(2x-5\right)$

 D. $ 2\left(3x-5\right)\left(x+2\right)$

30. The truth set of $8+2x-x^{2}=0$ is $ \left(p,q\right)$. Evaluate $p+q$.

 A. $-6$

 B. $ 2$

 C. $ -2$

 D. 4

31. Find the roots of the equation

 $ y=3x^{2}+x-7$.

 A. 1.0 and $-1.2$

 B. 1.1 and $-1.3$

 C. 1.4 and $-1.7$

 D. 2.0 and $-1.9$

* + 1. A box contains 13 currency notes, all

 of which are either ₦50 or ₦20 notes.

 The total value of the currency notes

 is ₦530. How many ₦50 notes are in

 the box?

 A. 4

 B. 6

 C. 9

 D. 10

33. Solve $\left(\frac{1}{9}\right)^{x+2}=243^{x-2}$

 A. $ x= \frac{7}{6}$

 B.$ x= -\frac{6}{7}$

 C. $ x = \frac{6}{7}$

 D. $ x=-\frac{7}{6}$

34. A casting is made up of copper and

 zinc. If 65$\%$ of the casting is zinc and there are 147 g of copper, what is the mass of the casting?

 A. 320 g

 B. 400 g

 C. 420 g

 D. 350 g

35. Determine the value of x for which

 $\left(x^{2}-1\right)>0$ ?

 **A.** $x>0$

 **B.**  $-1<x<1$

 **C.**  $x<-1$ **or** $x>1$

 **D.**  $x<-1$

36. Find the range of values of $x$ for which $ 3x-7\leq 0$ and $x+5>0$?

 A.  $-5<x<\frac{7}{3}$

 B.  $-5\leq x\leq \frac{7}{3}$

 C.  $-5\leq x<\frac{7}{3}$

 D.  $-5<x\leq \frac{7}{3}$

37.



 Which inequality describes the graph

 above?

A. $4y+5x\geq 20$

B.  $5y+4x\geq 20$

C.  $5y+4x\leq 20$

D.  $4y+5x\leq 20$

38. In a bag of oranges, the ratio of the

 good ones to the bad ones in the bag

 is 5 : 4, if the number of the bad

 oranges in the bag is 36, how many

 oranges are there altogether?

 A. 81

 B. 72

 C. 54

 D. 45

39. If the angle of a sector of a circle of

 diameter 8cm is 135°. Find the area

 of the sector [Take π = $\frac{22}{7}$].

 A. $9\frac{3}{7}cm^{2}$

 B. $12\frac{4}{7}cm^{2}$

 C. $18\frac{6}{7}cm^{2}$

 D. $25\frac{1}{4}cm^{2}$

40.



 In the diagram above, |XR| = |RY| =

 |YZ| and ∠XRY = ∠YRZ $=62°$,

 Calculate ∠XYZ.

 A.  $50°$

 B.  $62°$

C.  $115°$

D.  $150°$

41. The angle of elevation of the top of a cliff

 15 meters high from a landmark is 60º.

 How far is the landmark from the foot of

 the cliff? Leave your answer in surd form

 A.  $15\sqrt{3} m$

 B.  $15\sqrt{2} m$

 C.  $ 5\sqrt{3} m$

 D. $10\sqrt{3} m$

42. A ladder $5 m$ long long rest against a

 wall such that its foot makes an angle

 $30°$ wih the horizontal. How far is the

 foot of the ladder from the wall?

A.  5 $\frac{\sqrt{3}}{3}m$

B.  $2\frac{1}{2}m$

C.  5 $\frac{\sqrt{3}}{2}m$

D.  10 $\frac{\sqrt{3}}{3}m$

43. 

 The bar chart above shows the distribution of

 marks scored by a group of students in a test.

 Use the chart to answer the question below
 How many students took the test?

A.  38

B.  32

C.  15

D.  11

44.

|  |  |  |  |
| --- | --- | --- | --- |
| Class | $$1-3$$ | $$4-6$$ | $$7-9$$ |
| Frequency | $$5$$ | $$8$$ | $$5$$ |

 Find the standard deviation of the data

 using the table above

 A.   $5$

 B.  $\sqrt{5}$

 C.  $\frac{5}{3}$

 D.   $\sqrt{6}$

45. The mean of ten positive numbers is 16.

 When another number is added, the mean

 becomes 18. Find the eleventh number

 A.  3

 B.  38

 C.  30

 D.  40

46. If the mean of $2$, $5$, $\left(x+1\right)$, $\left(x+2\right)$, $7$ and

 $9$ is $6$.

 Find the median

A.  $ 5.5$

B.  $ 6.5$

C.  $ 6$

D.  $ 5$

47. A bag contains 3 white, 6 red and 5

 blue identical balls. A ball is picked at

 random from the bag. What is the

 probability that it is either white or

 blue?

1. $\frac{9}{14}$

B.$ \frac{4}{7}$

C. $ \frac{4}{15}$

 D. $ \frac{3}{14}$

48. The probability of picking a letter T from the

 word OBSTRUCTION is?

 A. $\frac{1}{10}$

 B.  $\frac{1}{11}$

 C.  $\frac{2}{11}$

 D.  $\frac{3}{11}$

49. The probability of a student passing

 any examination is $ \frac{2}{3}$. If the students

 takes three examination, what is the

 probability that he will not pass any of

 them?

 A.  $\frac{2}{3}$

 B. $\frac{1}{27}$

 C.  $\frac{8}{27}$

 D.  $\frac{4}{9}$

50. Two numbers are removed at random

 from the numbers 1, 2, 3 and 4. What is

 the probability that the sum of the

 numbers removed is even?

 A.  $\frac{2}{3}$

 B.  $\frac{1}{2}$

 C.  $ \frac{3}{4}$

 D.  $\frac{2}{5}$