KITH AND KIN INTERNATIONAL COLLEGE

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

 THIRD TERM EXAMINATION 2024/2025 ACADEMIC SESSION



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| **NAME** |  |
| **SUBJECT** |  **FURTHER MATHEMATICS** | **CLASS** | **SS 2** | **DURATION** | **2HOURS** |

**THEORY**

**(100 Marks)**

 **INSRUCTIONS**

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 2 questions from Part B.**
4. **Take acceleration due to gravity, except otherwise stated.**

**PART A (40 Marks)**

 Attempt **all** questions in this part.

1. The polynomial has as a factor and a remainder of **27** when divided by , where and are constants. Find the values of and . **WAEC 2021/1 (5 Marks)**
2. The roots of the equation are and , where is a constant.

 If , find The values of . **WAEC 2007/9 (5 Marks)**

1. If and , where is an obtuse and is acute, find the value of

 **WAEC 2008/6 (5 Marks)**

1. (a) There are 6 points in a plane. How many triangles can be formed with the points?

 (b) A family of 6 is to be seated in a row. In how many ways can this be done, if the father and mother

 are not to sit together? **WAEC 2016/5 (5 marks)**

 5. The points (7, 3), (2, 8) and (-3, 3) lie on a circle. Find the

 (a) equation and

 (b) radius of the circle **WAEC2006/9 (5 marks)**

 6. Five digit numbers are formed from digits 4, 5, 6, 7 and 8.

 (a) How many such numbers can be formed if repetition of digits is (i) allowed  (ii) not allowed?

 (b) How many of the numbers are odd, if repetition of digits is not allowed? **WAEC 2007/5 (5 marks)**

7. A body P of mass 5kg is suspended by two light inextensible strings AP and BP attached to a ceiling. If the

 strings are inclined at angles 40° and 30° respectively to the downward vertical, find the tension in each of

 the strings. **WAEC 2012/16a (5 marks)**

 8. An object is projected vertically upwards. Its height, **h** m, at time **t** seconds is given by

 Find ;

 (a) the time at which it is momentarily at rest

 (b) correct to two decimal places, the maximum height reached by the object. **WAEC 2007/8 (5 marks)**

**PART B (20 Marks)**

***Attempt three [3] questions only in this part.***

 9. (a) Simplify  and leave answer in terms of .

 (b) Find the equation of the line joining the stationary points of and the distance

 between them. **WAEC 2017/10 (10 Marks)**

 10. (a) Edem and his wife were invited to a dinner by a family of 5. They all sat in such a way that Edem sat

 next to his wife. Find the number of ways of seating them in a row.

 (b) A bag contains 4 red and 5 black identical balls. If 5 balls are selected at random, one after the other

 with replacement, find the probability that

1. a red ball was picked 3 times ; (ii) a black ball was picked at most 2 times.

 **WAEC 2015/13 (10 marks)**

 11. (a) If and are factors of , find the;

 (i) values of and ;

 (ii) remainder when is divided by **WAEC 2006/3**

 (b) Forces F1(18N,330°), F2(10N,090°), F1(18N,330°) ,F2(10N,090°) and F3(25N,180°), F3(25N,180°) act on a

 body at rest. Find, correct to one decimal place, the magnitude and direction of the resultant force.

 12. (a) Find the maximum and minimum points of the curve .

 (b) Sketch the curve in (a) above. **WAEC 2013/12**

 (c) Given that  and , find such that   and is in the direction

   .

 **WAEC 2012/17 (10 marks)**

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| **NAME** |  |
| **SUBJECT** |  **FURTHER MATHEMATICS** | **CLASS** | **SS 2** | **DURATION** | **1HOURS** |

**OBJECTIVE TEST**

 **(40 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 is a factor of find the remaining factors.
2. If , find
	1. -5
	2. 27
	3. 49
	4. 54
3. Factorize completely

 A.

 B.

 C.

 D.

1. If the solution set of

 is find the

 value of

 A.

 B.

 C. 4

 D. 5

5. Which of the following quadratic

 curves will not intersect with the -axis?

 A.

 B.

 C.

 D.

6. A rectangle has a perimeter of .If

 its area is to be a maximum, find its

 dimension.

 A. 12,12

 B. 6, 6

 C. 4, 8

 D. 9, 3

7. If has equal roots,

 find the value of .

 A. and

 B. and

 C. and

 D. and

8. If and are the roots of the equation , find the equation

 whose roots are and

 A.

 B.

 C.

 D.

1. A committee of 4 is to be selected from

 a group of 5 men and 3 women. In how

 many ways can this be done if the

 chairman of the committee must be a

 man?

 A.  15

 B.  40

 C.  70

 D.  175

 10. Given that the straight lines

 and

 are parallel, find a

 relationship connecting the constants

 and

 A.

 B.

 C.

 D.

1. Find the domain of ,

 the set of real numbers.

1. Find the value of

 leaving your answer in surd form.

1. The probabilities that a husband and

 wife will be alive in 15 years’ time are

 and respectively. Find the probability

 that only one of them will be alive at

 that time.

 A.

 B.

 C.

 D.

1. In a class of 50 pupils, 35 like Science

 and 30 like History. What is the

 probability of selecting a pupil who likes

 both Science and History?

 A.  0.10

 B.  0.30

 C.  0.60

 D.  0.70

1. A company took delivery of 12 vehicles

 made up of 7 buses and 5 saloon cars

 for two of its departments; Personnel

 and General Administration. If the

 Personnel department is to have at least

 3 saloon cars, in how many ways can

 these vehicles be distributed equally

 between the departments?

 A. 350

 B.  455

 C.  462

 D.  571

1. A basket contains 3 red and 1 white

 identical balls. A ball is drawn from the

 basket at random. Calculate the

 probability that it is either white or red.

* 1. 1
1. A force of 200 N acting on a body of

 mass 20 kg initially at rest causes it to

 move a distance of 320m along a

 straight line for t secs. Find the value of t.

 A.  4s

 B.  6s

 C.  8s

 D. 10s

1. A particle starts from rest and moves in a

 straight line such that its velocity, , at

 time seconds is given by

 . Calculate the distance

 covered in the first 2 seconds.

 A.  2

 B.  4

 C.  6

 D.  8

1. A three-digit odd number less than 500 is

 to be formed from 1,2,3,4 and 5. If

 repetition of digits is allowed, in how

 many ways can this be done?

* 1. 125
	2. 75
	3. 60
	4. 36
1. Find the maximum value of

 A.  1

 B.  2

 C.  3

 D.  4

1. Find the coefficient of in the

 binomial expansion of in

 ascending power of

 A.  432

 B.  194

 C.  144

 D.  108

1. If the points, and lie on the same straight line,

 find the values of .

 A.  and 3

 B.  and

 C.  and 3

 D.  and

1. Evaluate

 A.

 B.

 C.

 D.

24. Find the coefficient of  in the

 expansion of .

 A.

 B.

 C.

 D.

25. Given , evaluate

 A.  12

 B.

 C.  2

 D.

26. There are 7 boys in a class of 20. Find the

 number of ways of selecting 3 girls and 2

 boys

 A. 1638

 B. 2730

 C. 6006

 D. 7520

27. In how many ways can the letters of the

 word 'ELECTIVE' be arranged?

 A. 336

 B. 1680

 C. 6720

 D. 20160

28. A particle starts from rest and moves

 through a distance

 metres in time seconds.Find its

 acceleration in 1 second.

 A.  24

 B.  18

 C.  12

 D.  10

29. A body starts from rest and moves in a

 straight line with uniform acceleration

 of 5. How far, in metres does it go in

 10 seconds?

 A.  50 m

 B.  250 m

 C.  350 m

 D.  500 m

30. The initial and final velocities of an object

 of mass are and .

 Find the magnitude of its change in

 momentum.

1. 25
2. 15

31. If , find

 A.   −

 B.

 C.

 D.

32. Given that y = 2x - 1 and Δx = 0.1, find Δ y

 A.  0.20

 B.  0.15

 C.  0.10

 D.  0.05

33. Given that r = (10 N , 200º) and n = (16 N ,

 020º), find (3r - 2n).

A.  (62 N , 240º)

B.  (62 N , 200º)

C.  (62 N , 280º)

D.  (62 N , 020º)

34. Differentiate,   with respect to.

A.

B.

C.

D.

35. If , find

A.

B.

C.

D.

36. If , find

A.

B.

C.

D.

37. If , find

A.

B.

C.

D.

38. Evaluate

 A.

 B.

 C.

 D.

39. Given that , calculate

 the maximum value of .

A.

B.

C.

D.

40. Find the magnitude and direction of the

 vector

 A.  (13, 113.38°)

 B.  (13, 067.38°)

 C.  (13, 025.38°)

 D.  (13, 157.38°)