

# FEDERAL MINISTRY OF EDUCATION

.....DIVISION  
**TECHNOLOGY AND SCIENCE EDUCATION DEPARTMENT**  
*When replying, please quote earlier reference*

123

P. M. B. No. 146 GARKI  
Telegrams MINEDUCATE  
Telephone Telephone:



Ref. No. DTSE/04/C.5/I/III/123  
Date November 13, 2015

Dr. Attu Naji Raphael (Programme Director)  
GLOBAL SIX – SIGMA CONCEPT Limited  
COSCHARIS MOTORS PLAZA,  
Central Business District,  
Abuja.

**RE: REQUEST FOR COLLABORATION TO TRAIN MATHEMATICS TUTORS ON  
SKILL THAT WILL IMPROVE STUDENT PERFORMANCES IN SECONDARY  
SCHOOLS.**

With reference to your letter dated 2<sup>nd</sup> November, 2015 to the Permanent Secretary, Federal Ministry of Education on the above subject. I am directed to acknowledge the receipt of your letter to invite you to come and make the presentation of your programme at no exist to the Ministry.

2. Your presentation is scheduled as follows:

Date: Wednesday 25<sup>th</sup> November, 2015  
Time: 11.00am  
Venue: Director Technology and Science Education Office (8<sup>th</sup> Floor)

3. Accept the assurances of the Honourable Minister of Education regards.

**CHEGA, S. G**  
Director (Technology and Science Education)  
For: Honourable Minister of Education

# GLOBAL SIX SIGMA CONCEPT LTD

## (MATHEMATICAL EQUATION INFRASTRUCTURE PROJECT)

Summary of Equation Supremacy Over Other Mathematical Elements Using Junior WAEC Past Questions From Lagos, Rivers, Kaduna States and Three Rivers State Special Science Schools Mathematics Examination Past Questions to Further Prove the Assertion:

| S/N | STATE                                             | DESCRIPTION                                                                                                 | NO. OF EQUATION RELATED QUESTIONS AND PERCENTAGE      | NO. OF NON-EQUATION RELATED QUESTIONS AND PERCENTAGE | TOTAL NO. OF QUESTIONS AND PERCENTAGE                    | REMARK       |
|-----|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------|--------------|
| 1   | Lagos                                             | Junior School Certificate Examination Past Question, 2015 Mathematics                                       | 50 (83%)                                              | 10 (17%)                                             | 60 (100%)                                                | See attached |
| 2   | Rivers                                            | Junior School Certificate Examination Past Question, 2015 Mathematics                                       | 52 (87%)                                              | 8 (13%)                                              | 60 (100%)                                                | See attached |
| 3   | Kaduna                                            | Junior School Certificate Examination Past Question, 2015 Mathematics                                       | 53 (88%)                                              | 7 (12%)                                              | 60 (100%)                                                | See attached |
| 4   | <b>Average</b>                                    | <b>3 items</b>                                                                                              | <b>86%=Approx. 90%</b>                                | <b>14% = Approx. 10%</b>                             | <b>100%</b>                                              |              |
| 5   | Rivers State Special Science Entrance Examination | Common Entrance into Rivers State Special Science Schools, Past Questions Mathematics 1993, 1994, and 1995. | 1993 = 27 (90%)<br>1994 = 27 (90%)<br>1995 = 27 (90%) | 1993 = 3 (10%)<br>1994 = 3 (10%)<br>1995 = 3 (10%)   | 1993 = 30 (100%)<br>1994 = 30 (100%)<br>1995 = 30 (100%) | See attached |
| 6   | <b>Average</b>                                    | <b>3 items</b>                                                                                              | <b>90%</b>                                            | <b>10%</b>                                           | <b>100%</b>                                              |              |

 Attu Naji Raphael; PhD, FCNA, CMD Certified.



LAGOS STATE MINISTRY OF EDUCATION  
EXAMINATIONS BOARD  
2015 BASIC EDUCATION CERTIFICATE EXAMINATION

MATHEMATICS

LASEB/BECE/MATHEMATICS/2015/002

Time: 2hrs.

**INSTRUCTIONS TO CANDIDATES**

This paper consists of Two Sections viz; A: Objective Questions and B: Theory.

Write your Examination number in the space provided.

|   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | E | 1 | 5 | 2 | 0 | 0 | 2 | 8 | 0 | 0 | 2 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

NAME:.....

(Complete your name as it should be written; Surname first followed by other names.)

NAME OF SCHOOL:.....

Do not open this Question Booklet until you are told to do so. While you are waiting, read the following instructions carefully.

- (i) Attempt all questions. In Section A each question is followed by four options lettered A - D.
- (ii) Find out the correct option for each and shade your answer.
- (iii) Do not spend too much time on any question. If you find a question difficult, leave it and try it again later.
- (iv) **YOU ARE ADVISED TO WORK COMPLETELY ON YOUR OWN.**

# 214 JSCE MATHS ESSAY answer all questions

1. (a) Father of three children  
among his children using  
their ages in the ratio of  
2:3:4. If the youngest  
son received ₦7500

(i) How much was  
divided among  
the children?

(ii) The amount  
received by the  
second child.

(b) Expand  $(x + 2)(x^2 - 2x + 4)$

2. (a) Copy and complete the  
following addition table  
for base seven

| + | 1 | 2 | 3  | 4 | 5 | 6  |
|---|---|---|----|---|---|----|
| 0 | 1 | 2 | 3  | 4 | 5 | 6  |
| 1 | 2 |   |    |   |   |    |
| 2 |   | 4 |    |   |   |    |
| 3 |   |   |    |   |   |    |
| 4 |   |   |    |   |   |    |
| 5 |   |   | 11 |   |   |    |
| 6 |   |   |    |   |   | 15 |

(b) Construct  $\triangle ABC$  in  
which  $AB=9\text{cm}$ ,  
 $BC=12\text{cm}$  and  $\angle C$   
 $ABC=60^\circ$

ii. Construct the bisector  
of angles A and let it  
meet BC at D

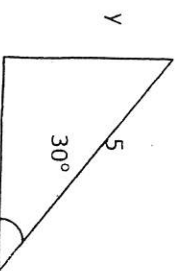
iii. Measure DC

3. (a) The vote cast for the  
following political parties  
are as followed  
APA=1000, BPC=1200,  
CPD=2000 and DPA=800  
Construct a pie-chart for  
this data.

(b) Find the value of  $999^2 - 1$ .

4. (a) The area of a  
trapezium  
is given as  $160\text{cm}^2$  if the  
length of one of the  
parallel sides is  $12\text{cm}$   
and the height is  $8\text{cm}$ .  
find the length of the  
other parallel side.

(b) Find the value of  
 $y$  if  $\sin 30^\circ = 0.5$



MINISTRY OF EDUCATION,  
KADUNA STATE  
EDUCATION RESOURCE CENTRE, KADUNA  
JUNIOR SCHOOL CERTIFICATE EXAMINATION,  
2014

Maths

Please **DO NOT** open this Question Booklet until you are told to do so. While you are waiting, read the following instructions carefully.

This paper consists of Two Sections:  
Section 1 Multiple Choice, Section 2 Essay.

**TIME ALLOWED: 2 HOURS**  
**ATTEMPT ALL QUESTIONS**

1. The Answer Sheet is provided. Write your Name, Examination Number, Subject and Name of School in the answer sheet provided.
2. Ensure that you read each question very carefully before answering it.
3. Answer the objective questions by shading the squares that correspond with the options you have chosen as your answers.
4. Do not waste time on any question. If you find any difficulty, go on to others and finish them before you return to the difficult one(s).
5. There must **NOT** be more than one shading for an answer. Any shading more than one will be marked wrong.
6. If you change your mind about an answer, completely erase the shading.
7. Use **2B** pencil.

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1.

Express 0.0004076 as a 2 significant figure

- (A) 0.00041  
(B) 0.00407  
(C) 0.00408  
(D) 0.408  
(E) 0.41

2.

Convert  $\frac{7}{8}$  to decimal

- (A) 0.775  
(B) 0.088  
(C) 0.875  
(D) 0.855  
(E) 0.675

3.

4 books were bought in the market at the following price: ₦15.50, ₦6.40, ₦17.25 and ₦23.75. find the total cost

- (A) ₦75.55  
(B) ₦65.96  
(C) ₦48.83  
(D) ₦62.90  
(E) ₦106.96

4.

A man has ₦100.00 and bought articles at the following prices, ₦15.20, ₦23.50 and ₦48.60. How much does he left?

- (A) ₦13.30  
(B) ₦12.70  
(C) ₦11.40  
(D) ₦10.20  
(E) ₦8.70

5.

Solve for x in the equation  $20 - x = 3x$

- (A) 16  
(B) 10  
(C) 5  
(D) -5  
(E) -10

6.

Simplify  $(3 + 5) - (5 - 3)$

- (A) 0  
(B) -5  
(C) 6  
(D) -6  
(E) -5

7.

Solve  $3y + 2 = 4/5$

- (A) 2  
(B)  $3\frac{1}{2}$   
(C)  $-2\frac{1}{2}$   
(D) -1  
(E) 3

8.

The pyramids of .....are very famous

- (A) Nigeria  
(B) Egypt  
(C) Ghana  
(D) Togo  
(E) Mali

9.

An EXACT value of  $\pi$  (n) is

- (A)  $\frac{22}{7}$   
(B)  $3\frac{1}{7}$   
(C) 3.142  
(D) 3.1  
(E)  $\frac{7}{22}$

10.

A complete revolution is equal to

- (A)  $90^\circ$   
(B)  $360^\circ$   
(C)  $270^\circ$   
(D)  $180^\circ$   
(E)  $0^\circ$

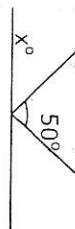
11.

A perpendicular pole makes an angle of

- (A)  $30^\circ$   
(B)  $90^\circ$   
(C)  $180^\circ$   
(D)  $270^\circ$   
(E)  $360^\circ$

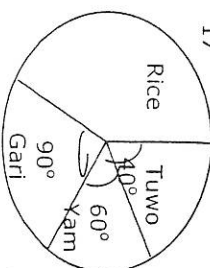
12.

Find  $x^\circ$  from the figure below



- (A)  $28^\circ$   
(B)  $56^\circ$   
(C)  $62^\circ$   
(D)  $65^\circ$   
(E)  $130^\circ$

The pie-chart represents 720 people with the food they like. Use the Pie-chart for question 13 - 17



13.

What is the size of angle for those who like Rice?

- (A)  $195^\circ$   
(B)  $170^\circ$   
(C)  $135^\circ$   
(D)  $150^\circ$   
(E)  $360^\circ$

14.

How many people like Gari?

- (A)  $140^\circ$   
(B)  $160^\circ$   
(C)  $170^\circ$   
(D)  $180^\circ$   
(E)  $190^\circ$

15.

How many people like Tuwo?

- (A)  $40^\circ$   
(B)  $60^\circ$   
(C)  $70^\circ$

16.

How many people like Yam?

- (A)  $120^\circ$   
(B)  $130^\circ$   
(C)  $140^\circ$   
(D)  $150^\circ$   
(E)  $160^\circ$

17.

How many people like Rice?

- (A)  $180^\circ$   
(B)  $300^\circ$   
(C)  $340^\circ$   
(D)  $360^\circ$   
(E)  $370^\circ$

18.

When  $x = 9$  and  $y = 5$  the value of  $3x - 6y$  is:

- (A) 3  
(B) 1  
(C) 0  
(D) -1  
(E) -3

19.

If n is doubled and 7 subtracted, the result is 23. Find the value of n.

- (A) 60  
(B) 30  
(C) 16  
(D) 15  
(E) 5

20.

Simplify  $144 \div 36$

- (A) 8  
(B) 6  
(C) 5  
(D) 4  
(E)  $\frac{1}{4}$

21.

Find the sum of the following integers: 20, -18, 16, -25

- (A) 1

25. (B) 25  
(C) 23  
(D) 22  
(E) -32

22. If  $x = 2$ ,  $y = -2$  and  $z = -4$  evaluate  $xy - z$

- (A) 0  
(B) -8  
(C) 10  
(D) -10  
(E) 8

23. Simplify  $3 + (-9) - (+2)$

- (A) -4  
(B) -7  
(C) -8  
(D) -14  
(E) 10

24. The vertical angle of an isosceles triangle is  $70^\circ$ . What is the size of each of the base angles?

- (A)  $55^\circ$   
(B)  $110^\circ$   
(C)  $125^\circ$   
(D)  $62.5^\circ$   
(E)  $50^\circ$

25. Solve  $75^\circ 16' - 49^\circ 54'$

- (A)  $25^\circ 32'$   
(B)  $25^\circ 20'$   
(C)  $25^\circ 38'$   
(D)  $25^\circ 22'$   
(E)  $25^\circ 25'$

26. Evaluate  $0.035\%$

- (A) 35  
(B) 3.5  
(C) 0.035  
(D) 350  
(E) 0.0035

27. 40% of 120

- (A) 180  
(B) 160  
(C) 48  
(D) 38  
(E) 28

28. Give the decimal expansion of  $1/6$

- (A) 0.16  
(B) 0.0625  
(C) 0.625  
(D) 0.016  
(E) 16

29. What formula is used to find the volume of a cylinder?

- (A)  $\pi r^2 h$   
(B)  $2\pi r^2 h$   
(C)  $4/3\pi r^3 h$   
(D)  $2\pi r$   
(E)  $2\pi r h$

30.  $\frac{L \times 100}{P \times R}$  is the formula for finding

- (A) Rate  
(B) Interest  
(C) Principal  
(D) Time  
(E) Volume

31. Simplify  $17x/-17$

- (A)  $x$   
(B)  $x^2$   
(C) 1  
(D)  $-x^2$   
(E)  $-x$

32. Expand  $a + 2(a + b)$

- (A)  $2a + 2b$   
(B)  $2a - 2b$   
(C)  $3a + 2b$   
(D)  $2a + 2b$   
(E)  $3a - 2b$

33. Cor. 316 3 significant figures.

- (A) 9.30  
(B) 9.31  
(C) 9.32  
(D) 9.33  
(E) 9.317

34. Solve for  $x$  and  $y$  in the simultaneous equation;  
 $2x + y = 7$   
 $x - y = 2$

- (A)  $x = 3, y = 1$   
(B)  $x = 1, y = 3$   
(C)  $x = 4, y = 1$   
(D)  $x = 1, y = 4$   
(E)  $x = 2, y = 3$

35. Expand  $(x - 3)^2$

- (A)  $x^2 + 6x + 9$   
(B)  $x^2 - 6x + 9$   
(C)  $x - 9x + 6$   
(D)  $x + 9x - 6$   
(E)  $x^2 + 12x + 9$

36. Divide  $-36$  by  $9$

- (A)  $+27$   
(B)  $-27$   
(C)  $+4$   
(D)  $-4$   
(E)  $+6$

37. Evaluate  $2^3 \times 3^2$

- (A) 36  
(B) 24  
(C) 18  
(D) 75  
(E) 72

38. What is the HCF of 24, 42 and 48

- (A) 8  
(B) 6  
(C) 3  
(D) 2  
(E) 1

40. What name is given to nine sided polygon?

- (A) 1999  
(B) 9991  
(C) 9990  
(D) 1990  
(E) 2000

41. Multiply  $8.735$  by  $100$

- (A) 8735  
(B) 873.5  
(C) 875.3  
(D) 87.35  
(E) 87.53

42. Add  $110100_{\text{two}} + 1011_{\text{two}}$

- (A)  $110100_{\text{two}}$   
(B)  $101101_{\text{two}}$   
(C)  $100011_{\text{two}}$   
(D)  $111111_{\text{two}}$   
(E)  $111011_{\text{two}}$

43. Convert  $75_{\text{ten}}$  to base two

- (A)  $1001011_{\text{two}}$   
(B)  $101000_{\text{two}}$   
(C)  $1110110_{\text{two}}$   
(D)  $1100011_{\text{two}}$   
(E)  $110001_{\text{two}}$

44. Find the median of the following  
2, 7, 5, 7, 0, 1, 3, 5,

- (A) 5  
(B) 4  
(C) 3  
(D) 2  
(E) 1

Handwritten calculations:  
 $56 \times 2 = 112$   
 $222 \times 3 = 666$   
 $222 \times 32 = 7104$

45.

What is the LCM of 6, 8, 9 and 12?

- (A) 24  
(B) 48  
(C) 72  
(D) 96  
(E) 108

46.

If ₦20 is shared in the ratio 3:1. What is the highest share?

- (A) 25  
(B) 20  
(C) 15  
(D) 10  
(E) 5

47.

Angle on a straight line is

- (A)  $360^\circ$   
(B)  $270^\circ$   
(C)  $290^\circ$   
(D)  $180^\circ$   
(E)  $90^\circ$

48.

Find the simple interest on ₦400.00 for 2 years at 8%

- (A) ₦37.00  
(B) ₦37.12  
(C) ₦64.00  
(D) ₦85.00  
(E) ₦37.12

49.

Find the value  $(\frac{196}{225})^{1/2}$

- (A)  $17/14$   
(B)  $15/14$   
(C)  $14/17$   
(D)  $14/15$   
(E)  $7/14$

50.

Find the HCF of  $2a^3b$  and  $10ab$

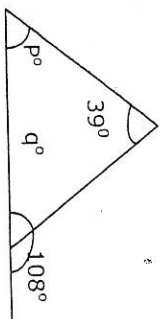
- (A)  $5ab$   
(B)  $4ab$   
(C)  $3ab$

51.

Express 250,000 in standard form

- (A)  $0.25 \times 10^5$   
(B)  $2.5 \times 10^3$   
(C)  $2.5 \times 10^5$   
(D)  $25 \times 10^4$   
(E)  $25 \times 10^5$

Use the triangle to answer questions 52 - 53



What is angle p?

- (A) 29  
(B) 39  
(C) 49  
(D) 59  
(E) 69

53.

What is angle q?

- (A) 72  
(B) 82  
(C) 92  
(D) 102  
(E) 122

54.

Divide 62.5 by 0.025 and express the answer in standard form.

- (A)  $2.5 \times 10^1$   
(B)  $2.5 \times 10^2$   
(C)  $2.5 \times 10^3$   
(D)  $2.5 \times 10^{-2}$   
(E)  $2.5 \times 10^{-3}$

55.

The angles of an irregular pentagon are in the following ratio 3:5:6:7:9. Find the largest angle

- (A) 132  
(B) 142  
(C) 152  
(D) 162  
(E) 172

56.

Add together 42 five and 131 five

- (A) 243 five  
(B) 242 five  
(C) 232 five  
(D) 224 five  
(E) 223 five

57.

Factorize  $a^2 - 9a + 3a - 27$

- (A)  $(a + 3)(a - 9)$   
(B)  $(a - 3)(a - 9)$   
(C)  $(a + 3)(a + 9)$   
(D)  $(a - 3)(a + 9)$   
(E)  $(a^2 - 3)(a + 9)$

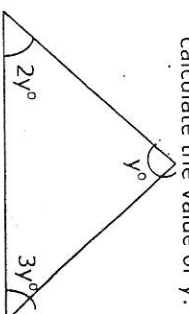
58.

In a class there 20 boys and 5 girls. If the door of the class is opened by one of the student. What is the probability that it is opened by a boy?

- (A)  $1/5$   
(B)  $2/5$   
(C)  $3/5$   
(D)  $4/5$   
(E)  $1/4$

59.

From the triangle below calculate the value of Y.



- (A)  $20^\circ$   
(B)  $30^\circ$   
(C)  $40^\circ$   
(D)  $50^\circ$   
(E)  $60^\circ$

60.

The volume V occupied by gas varies inversely with the pressure P, when  $V=30$ ,  $P=12$ . Find V when  $P=120$

- (A) 6  
(B) -5  
(C) 4  
(D) 5  
(E) 2



**RIVERS STATE OF NIGERIA  
MINISTRY OF EDUCATION  
JUNIOR SCHOOL CERTIFICATE EXAMINATION**

**2015**

**MATHEMATICS**

**TIME ALLOWED: 2 HOURS**

**INSTRUCTIONS TO CANDIDATES**

1. Candidates are allowed 5 minutes to read the instructions on this paper
2. Answer **All** Questions in Section A and **4** Questions in Section B
3.
  - A. Write your Centre Number
  - B. Write your Examination Number
  - C. Write your NAME and
  - D. Write the Name of your School
  - E. **DO NOT OPEN** this booklet until you are asked to do so.
4. Return the **ANSWER SHEET** to the supervisor at the end of the Examination, and keep the question paper.

**MATHEMATICS**  
**SECTION A- OBJECTIVES**

**INSTRUCTION:** Answer all the questions in this section. Each question is followed by four options lettered A-D. Choose the correct answer that best fits the question.

1. How do you write this number using words? 1900

- (A) Nine hundred and seven
- (B) One thousand six hundred
- (C) One thousand, nine hundred
- (D) One thousand nine hundred and thirty

2. Write three thousand and forty-six in digits.

- (A) 3046
- (B) 4036
- (C) 300046
- (D) 400036

3. In 1,537, in which place is the 5?

- (A) Ones/units
- (B) Tens
- (C) Hundreds
- (D) Thousands

4. What number does this Roman numeral represent?  
XXX

- (A) 30
- (B) 300
- (C) 3
- (D) 3000

5. How do you write 0.5 as a fraction?

- (A)  $\frac{1}{5}$
- (B)  $\frac{1}{10}$
- (C)  $\frac{1}{4}$
- (D)  $\frac{1}{2}$

6. Round off each number and estimate the product  
 $2.1 \times 6.748$  to the nearest whole number.

- (A) 14,000
- (B) 12,000
- (C) 18,000
- (D) 12,748

7. What is the reciprocal of  $\frac{1}{9}$

- (A)  $\frac{1}{9}$
- (B) 1
- (C) 9
- (D) 10

8. Simplify  $\frac{7}{8} \div 1\frac{3}{4}$

- (A)  $\frac{1}{2}$
- (B)  $\frac{4}{7}$
- (C)  $\frac{1}{3}$
- (D)  $\frac{3}{8}$

9. Simplify  $-\frac{1}{8} \times 4$ .

- (A)  $\frac{1}{4}$
- (B)  $-\frac{3}{8}$
- (C)  $\frac{3}{4}$
- (D)  $-\frac{1}{2}$

10. Find the value of the expression  $4 + y + 9 + 1 + z$   
for  $y = 5$  and  $z = 1$ .

- (A) 20
- (B) 18
- (C) 17
- (D) 19

11. Is  $x = 7$  a solution to this equation?  $63 = 9x$ .

- (A) YES
- (B) NO
- (C) NONE
- (D) ALL

12. Calculate the value of the expression  $y + 0.5$  for  $y = 6$ .

- (A) 5.6
- (B) 6.5
- (C) 5.06
- (D) 6.05

13. Solve for Z if  $Z = 9(5)$ .

- (A) 95
- (B) 45
- (C) 59
- (D) 14

14. Evaluate  $3^3$

- (A) 3
- (B) 9
- (C) 6
- (D) 27

15. Evaluate  $(\frac{1}{2})^2$

- (A)  $\frac{1}{4}$
- (B) 1
- (C)  $\frac{1}{2}$
- (D) 2

16. Evaluate  $16 \times (-2) \div (-16)$ .

- (A) 16
- (B) 2
- (C) 8
- (D) -2

17. How many millilitres are there in 2 teaspoons if 1 teaspoon  $\approx$  4.9ml.

- (A) 9.8ml
- (B) 98ml
- (C) 8.9ml
- (D) 89ml

18. Three people went on vacation. Tee visited a location with temperature  $95^\circ\text{F}$ , Sobi visited a location with temperature  $29^\circ\text{F}$  and Tammy visited a location with temperature  $80^\circ\text{F}$ . Arrange the temperatures of the location from coolest to warmest.

- (A) Sobi's, Tammy's, Tee's
- (B) Tee's, Sobi's, Tammy's
- (C) Tammy's, Sobi's, Tee's
- (D) Sobi's, Tee's, Tammy's

19. There are 14 students eating in the cafeteria. If 7 students are eating on each table, how many tables are being used?

- (A) 14
- (B) 7
- (C) 2
- (D) 21

20. 2 20 35 132 Which two numbers in the box have a quotient of 10?

- (A)  $2 \div 20$
- (B)  $35 \div 2$
- (C)  $20 \div 2$

21. Subtract 12, 464 - 9, 326

- (A) 3,138
- (B) 9,138
- (C) 3, 464
- (D) 4138

22. A car company produced 27, 690 cars in North America and 74, 247 cars in Europe. How many cars are produced in all?

- (A) 120, 937
- (B) 270, 690
- (C) 101, 937
- (D) 74, 937

23. Is 20 a prime number or a composite number?

- (A) Prime number
- (B) Composite number

24. Select the digits that will make the sentence true. 1?, 229?, 09? are divisible by 5

- (A) 0, 7
- (B) 0, 5
- (C) 8, 5
- (D) 0, 8

25. What is the greatest common factor of 18 and 6?

- (A) 6
- (B) 12
- (C) 24
- (D) 2

26. Calculate the least common multiple of 12 and 6.

- (A) 6
- (B) 12
- (C) 18
- (D) 3

27. How do you write 7, 100 in scientific notation?

- (A)  $7.1 \times 10^4$
- (B)  $71.0 \times 10^3$
- (C)  $7.1 \times 10^3$
- (D)  $71.1 \times 10^2$

28. Which sign makes the statement true?  $771 ? 7.71 \times 10^1$

- (A)  $>$
- (B)  $<$
- (C)  $=$
- (D)  $\neq$

29. Which of the following is an integer?

- (A) 0
- (B) 3.854
- (C)  $\frac{5}{9}$
- (D) 6.200

30. Round off 45.4 to the nearest whole number.

- (A) 46
- (B) 45
- (C) 44
- (D) 44.5

31. Tara bought 31 pounds of potatoes and 2.35 pounds of carrots. How many pounds of vegetables did she buy in all?

- (A) 33 pounds
- (B) 33.35 pounds
- (C) 29.65 pounds
- (D) 34.35 pounds

32. Solve  $\square + 7 = 8$ .

- (A)  $y = 7$
- (B)  $y = 1$
- (C)  $y = 8$
- (D)  $y = 0$

33. Find the missing number that makes these fractions equal  $\frac{1}{\square} = \frac{3}{9}$

- (A) 2
- (B) 1
- (C) 3
- (D) 4

34. Round  $30\frac{7}{19}$  to the nearest whole number.

- (A) 30.7
- (B) 31
- (C) 30
- (D) 30.19

35. Simplify  $\frac{5}{7} - \frac{3}{7}$ .

- (A)  $\frac{2}{7}$
- (B)  $\frac{3}{7}$
- (C)  $\frac{3}{5}$
- (D)  $\frac{5}{3}$

36. Multiply  $\frac{1}{7} \times \frac{1}{3}$ .

- (A)  $\frac{2}{7}$
- (B)  $\frac{2}{21}$
- (C)  $\frac{2}{10}$
- (D)  $\frac{1}{21}$

37. Evaluate  $4^2$

- (A) 6
- (B) 2
- (C) 16
- (D) 8

38. Are these ratios equivalent?  $\frac{2}{3}$  and  $\frac{8}{12}$

- (A) Yes
- (B) No

39. Find the unit rate: 12 houses on 2 blocks = ? houses per block.

- (A) 2 houses
- (B) 6 houses
- (C) 24 houses
- (D) 4 houses

40. Solve for W in  $\frac{9}{W} = \frac{6}{4}$ .

- (A) 6
- (B) 4
- (C) 9
- (D) 5

41. Convert 0.97 to percentage.

- (A) 97%
- (B) 9.7%
- (C) 970%
- (D) 0.97%

42. What is 80% of ₦ 80?

- (A) ₦ 80
- (B) ₦ 100
- (C) ₦ 70
- (D) ₦ 64

! cm

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tions

and 360

43. Calculate the percentage change from 200, 000 to 20, 000.

- (A) 90% increase
- (B) 92% increase
- (C) 92% decrease
- (D) 90% decrease

44. In 30% off sale, if an antique clock has a sale price of ₦427, what was the original price?

- (A) ₦430
- (B) ₦510
- (C) ₦410
- (D) ₦610

45. Evaluate  $101_2 - 11_2$

- (A)  $10_2$
- (B)  $11_2$
- (C)  $110_2$
- (D)  $101_2$

46. The formula for simple interest I is?

- (A)  $P = IRT$
- (B)  $I = \frac{PRT}{100}$
- (C)  $R = \frac{100}{PT}$
- (D)  $I = \frac{PR}{100T}$

47. Last year, egg producers in Abrabel farm produced 3, 362 eggs. This year, those same people in the same farm produced 1, 700 more eggs than last year. About how many eggs did the farm produce this year? Choose the best estimate to the nearest thousand.

- (A) 5, 000
- (B) 10, 000
- (C) 3, 000
- (D) 4, 000

48. If 1 inch  $\approx$  2.5cm, 3 inches is the same as how many centimeters? Round your answer to the nearest tenth.

- (A) 5.5cm
- (B) 5.0cm
- (C) 7.5cm
- (D) 6.5cm

49. Simplify the expression  $5h + 8h$ .

- (A)  $3h$
- (B)  $40h$
- (C)  $2h$
- (D)  $13h$

50. Is  $g = 2$  a solution to the equation  $3 = \frac{6}{g}$ ?

- (A) No
- (B) Yes

51. Solve for n, in  $5 = n - 3$ .

- (A) 8
- (B) 2
- (C) 3
- (D) 15

52. Find the value of S in  $5s - s = 20$ .

- (A) 2
- (B) 5
- (C) 4
- (D) 15

53. Simplify the expression  $4(1+5b)$ .

- (A)  $4b + 5b$
- (B)  $4 + 20b$
- (C)  $4 - 20b$
- (D)  $4b + 5$

54. Of the 10 people attending a maths lesson, 4 have blue eyes. What is the probability that a randomly selected person has blue eyes?

- (A)  $\frac{2}{5}$
- (B)  $\frac{5}{2}$
- (C)  $\frac{3}{5}$
- (D)  $\frac{5}{3}$

55. What is the mode of the set of numbers, 5, 7, 5, 0, 9, 1?

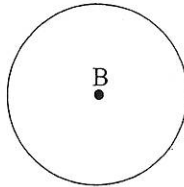
- (A) 7
- (B) 0
- (C) 5
- (D) 9

56. Bukky used coupons 7 times at the store last month. The savings were: ₦2, ₦1, ₦5, ₦5, ₦2, ₦2, ₦4. What was the mean amount saved?

(A) ₦3  
(B) ₦7  
(C) ₦5  
(D) ₦2

57. In this circle, what is B?

(A) Radius  
(B) Center  
(C) Chord  
(D) Diameter



58. Rearrange these fractions in ascending order

$$\frac{6}{10}, \frac{8}{10}, \frac{2}{10}$$

(A)  $\frac{2}{10}, \frac{6}{10}, \frac{8}{10}$   
(B)  $\frac{6}{10}, \frac{8}{10}, \frac{2}{10}$   
(C)  $\frac{8}{10}, \frac{6}{10}, \frac{2}{10}$   
(D)  $\frac{2}{10}, \frac{8}{10}, \frac{6}{10}$

59. Write the missing number in the equivalent fractions  $\frac{8}{10} = \frac{?}{100}$

(A) 80  
(B) 10  
(C) 8  
(D) 18

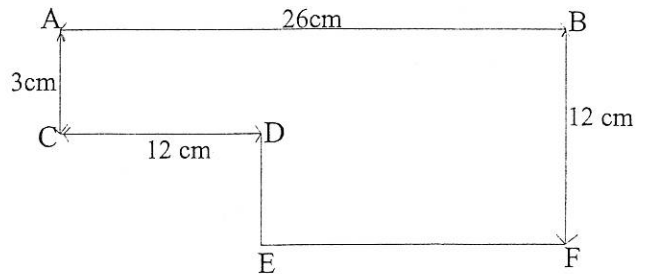
60. What is the median in this set of numbers? 3, 1, 0, 7, 9, 1, 1?

(A) 3  
(B) 0  
(C) 1  
(D) 7

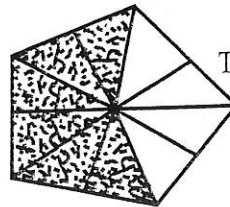
## SECTION B- ESSAY

INSTRUCTION: Answer any four (4) questions. Show all working.

1. Calculate the area of the shape below.



2.



This figure is a regular polygon.

- Name the type of polygon it is.
  - What percentage of the polygon is shaded?
3. a. Convert 9 to a base 2 number.
- b. Evaluate  $111_2 + 110_2$
4. Find the missing numbers in the equivalent fractions  $\frac{35}{60} = \frac{a}{24} = \frac{7}{b}$ .
5. Calculate the highest common factor of 216, 288 and 36

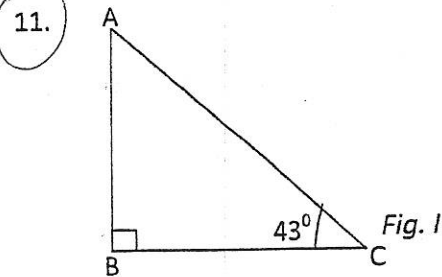
**MATHEMATICS**  
**SECTION A (OBJECTIVE)**

**INSTRUCTION:** Answer all questions.

1. Simplify  $(45) - (+14)$   
A. +9    B. +19    C. -9    D. -19
2. If  $\frac{3}{4}$  of a certain number is equal to  $4\frac{1}{2}$ , find the number.  
A. 18    B. 9    C. 6    D. 4
3. Letter Z is 26 in base ten; decode Z in binary scale.  
A. 11010    B. 00101  
C. 101010    D. 11101
4. If 3 is added to three quarters of a certain number, the result is 30. Find the original number.  
A. 27    B. 30    C. 36    D. 44
5. Solve for q; if  $\frac{5q - 21}{14} = 1$   
A.  $q = 35$     B.  $q = 14$   
C.  $q = 7$     D.  $q = 0$
6. A box has a square base of side 9cm. Calculate the volume of the box if it is 10cm high.  
A.  $810\text{cm}^3$     B.  $90\text{cm}^3$   
C.  $81\text{cm}^3$     D.  $27\text{cm}^3$
7. How many lines of symmetry has a kite?  
A. 5    B. 4    C. 3    D. 1
8. A card is picked at random from a pack of 52 playing cards. The probability that it is a "6" is ...  
A.  $\frac{1}{52}$     B.  $\frac{1}{13}$     C.  $\frac{1}{26}$     D.  $\frac{3}{26}$
9. An airport runway measuring 450m is drawn to a scale of 1cm to represent 100m. Find its length in the drawing.

- A. 5.5cm    B. 4.5cm  
C. 4.0cm    D. 3.5cm

10. What is the area of a triangle with base 4cm and height 8cm?  
A.  $6\text{cm}^2$   
B.  $9\text{cm}^2$   
C.  $14\text{cm}^2$   
D.  $16\text{cm}^2$



Find the value of m if  $\angle AB/ = 7\text{m}$ , angle  $ACB = 43^\circ$  and  $\tan 43^\circ = 0.93$ ,  $\sin 43^\circ = 0.68$  and  $\tan 47^\circ = 1.07$

- A. 4.76m  
B. 6.51m  
C. 7.49m  
D. 9.57m

12. Three babies A, B and C cry out at every interval of time. Baby A cries out at every 20 minutes, while B cries out at every 30 minutes and C at every 40 minutes. If they are observed at the same time, after what time will the three of them cry together?  
A. After 20 minutes  
B. After 30 minutes  
C. After 40 minutes  
D. After 120 minutes

13. Given that  $V = \pi r^2 h$ ; express  $r$  in terms of  $V$ ,  $\pi$  and  $h$ .

A.  $r = \sqrt{\frac{h}{\pi V}}$

B.  $r = \sqrt{\frac{V\pi}{h}}$

C.  $r = \sqrt{\frac{\pi h}{r}}$

D.  $r = \sqrt{\frac{V}{\pi h}}$

14. Express 32% as a fraction.

A.  $\frac{2}{25}$

B.  $\frac{4}{25}$

C.  $\frac{6}{25}$

D.  $\frac{8}{25}$

15. Which of the following pairs of plane figures have their diagonals equal and intersect at their centres?

- A. Kite and rectangle  
B. Parallelogram and rhombus  
C. Parallelogram and kite  
D. Rectangle and square

16. Write the year 2015 in Roman numerals.

- A. MMLV      B. MXMV  
C. MMXV      D. MMVX

17.

| Score     | 0 | 1 | 2 | 3 | 4 | 5' |
|-----------|---|---|---|---|---|----|
| Frequency | 3 | 4 | 6 | 8 | 5 | 4  |

The frequency table above is presented as a pie chart. The sectorial angle of score "3" is ...

- A.  $96^\circ$       B.  $72^\circ$       C.  $36^\circ$       D.  $18^\circ$

18. Solve the equation:  $p^2 - 4p + 4 = 0$

- A.  $p = -4$  twice      B.  $p = -2$  twice  
C.  $p = 2$  twice      D.  $p = 4$  twice

19. Each face of a cuboid is in the shape of a

- A. triangle      B. rectangle  
C. square      D. circle

20. If  $X \propto YZ$  and  $Y = 2$ ,  $Z = 3$  when  $X = 30$ , find  $X$  when  $Y = 4$  and  $Z = 6$ .

- A. 150      B. 120  
C. 70      D. 35

21. Find the simple interest on ₦6,000.00 for 5 years at 9% per annum.

- A. ₦270.00  
B. ₦2,700.00  
C. ₦5,400.00  
D. ₦27,000.00

22. Calculate the third angle of triangle in which two of the angles are  $103^\circ$  and  $42^\circ$ .

- A.  $35^\circ$       B.  $42^\circ$   
C.  $53^\circ$       D.  $103^\circ$

23. Solve the equations:

$$y = 2x - 4$$

$$3x + y = 11$$

A.  $x = \frac{7}{5}$ ,  $y = -\frac{6}{5}$

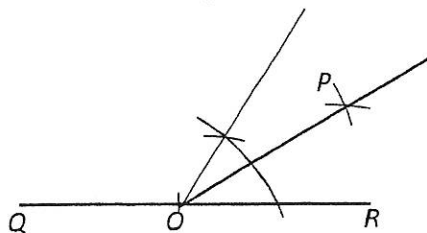
B.  $x = -\frac{6}{5}$ ,  $y = \frac{7}{5}$

C.  $x = 3$ ,  $y = 2$

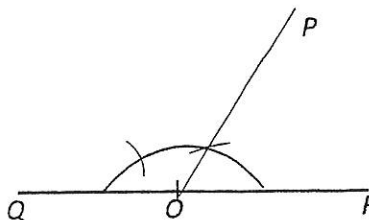
D.  $x = 2$ ,  $y = 3$

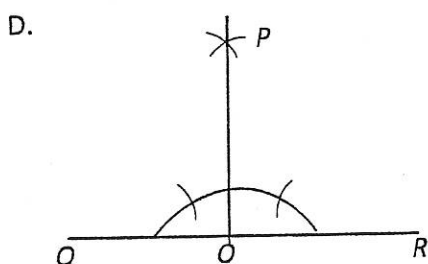
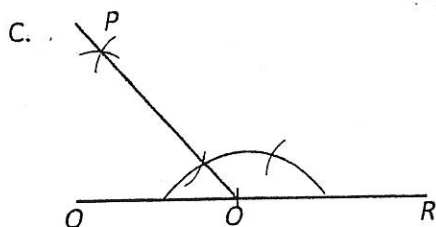
24. Which of these is the correct sketch of the construction of angle  $30^\circ$ ?

A.



B.

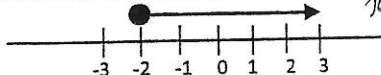




25. The probability that daddy will buy bread on his way home is  $\frac{3}{5}$  while the probability that mummy will buy bread on her way home is  $\frac{2}{7}$ . Find the probability that either daddy or mummy will buy bread on their way home.

A.  $\frac{4}{35}$  B.  $\frac{6}{35}$  C.  $\frac{11}{35}$  D.  $\frac{31}{35}$

26. Which is the correct interpretation of the inequality represented in the number line below?



A.  $x < -2$  B.  $x > -2$   
C.  $x < +2$  D.  $x > +2$

27. Round off the number 0.075 to one significant figure.

A. 0.1 B. 0.7  
C. 0.07 D. 0.08

28. The height of a triangle is twice its base. If its area is  $121\text{cm}^2$ , find its base.

A. 10cm B. 11cm  
C. 20cm D. 22cm

29. The line drawn across two parallel lines is called a ...

A. chord B. diameter  
C. radius D. transversal

30. Find the square root of  $12\frac{1}{4}$ .

A.  $1\frac{3}{4}$  B.  $3\frac{1}{2}$  C.  $3\frac{3}{4}$  D.  $6\frac{1}{4}$

31. Calculate the area of a square advertising board of length 14cm.

A.  $196\text{cm}^2$  B.  $169\text{cm}^2$   
C.  $691\text{cm}^2$  D.  $961\text{cm}^2$

- 32.

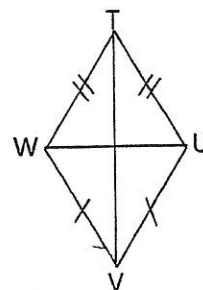


Fig. II

From the diagram above, which of these is the line of symmetry of the figure?

A. Line TU B. Line TV  
C. Line WU D. Line VU

33.  $q$  varies jointly as  $m$  and  $n$ . If  $q = 24$  when  $m = 4$  and  $n = 3$ , find  $m$  when  $q = 36$  and  $n = 4$ .

A. 1 B. 2 C. 3 D. 4

34. Find  $\square$  if  $\frac{5}{9} = \frac{\square}{36}$

A. 10 B. 15 C. 20 D. 25

- 35.

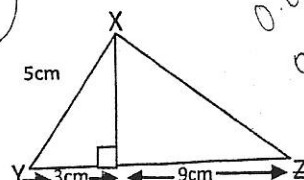
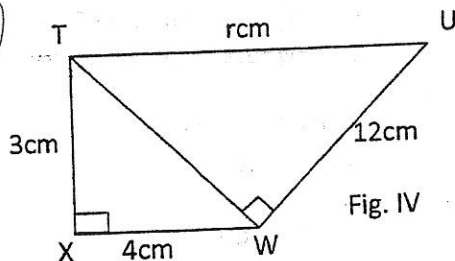


Fig. III

Find the area of triangle XYZ

A.  $16\text{cm}^2$  B.  $18\text{cm}^2$   
C.  $20\text{cm}^2$  D.  $24\text{cm}^2$

36.



The value of  $r$  in the diagram above is ...

- A. 3cm      B. 5cm  
C. 12cm     D. 13cm

37. Write  $3.05 \times 10^{-5}$  in decimal notation.

- A. 0.0000305      B. 0.000305  
C. 0.00305        D. 0.0305

38. Express 13.47kg to the nearest whole number.

- A. 10kg      B. 13kg  
C. 13.5kg    D. 14kg

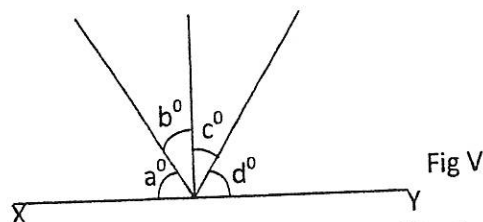
39. Write in figure: Fifty three million, eight hundred thousand and thirteen.

- A. 53,800,013      B. 5380013  
C. 538013          D. 530813

40. A straight line joining two points on the circumference of a circle and passing through the centre of the circle is called ...

- A. chord      B. diameter  
C. radius     D. segment

41.



What is the value of  $a + b + c + d$  in the figure above?

- A.  $90^\circ$       B.  $180^\circ$   
C.  $270^\circ$      D.  $360^\circ$

42. How many cubes of edges 3cm x 3cm x 3cm can be found in a cuboid of dimension 3cm x 6cm x 9cm?

- A. 3      B. 6      C. 9      D. 12

43. Express 55 minutes as a fraction of an hour.

- A.  $\frac{1}{12}$       B.  $\frac{1}{6}$       C.  $\frac{5}{6}$       D.  $\frac{11}{12}$

44. Express 1.5km in metres.

- A. 1,500 metres      B. 150 metres  
C. 15 metres        D. 1.5 metres

45. The tally represents the number ...

- A. 25      B. 26      C. 51      D. 55

46. The sum of 6 and a number is equal to the product of the number and 7. Find the number.

- A. 0      B. 1      C. 2      D. 3

47. Simplify:  $1110111_{\text{two}} - 1101011_{\text{two}}$

- A.  $11100_{\text{two}}$       B.  $1110_{\text{two}}$   
C.  $1100_{\text{two}}$       D.  $100_{\text{two}}$

48. ... is a device used for counting, adding and subtracting numbers.

- A. Abacus      B. Calculator  
C. Four figure tables      D. slide rule

49. The next term in the sequence 2, 5, 11, 23, is ...

- A. 28      B. 41      C. 47      D. 50

50. The sum of three consecutive even numbers is 72. What is the highest number?

- A. 20      B. 22      C. 24      D. 26

51. Find the least number by which 112 must be multiplied to give a perfect square.

- A. 7      B. 5      C. 3      D. 2

52. The value of the 1 in 12345 is ...

- A. one unit      B. one hundred  
C. one thousand      D. ten thousand

53. Olu saves ₦700.00 daily. How much will he save in 15 days?

- A. ₦950.00      B. ₦1050.00  
C. ₦1250.00      D. ₦1500.00

54. A solid whose faces are triangular and the base is a quadrilateral is called a ...

- A. sphere      B. pyramid  
C. prism      D. cube

55. Arrange in ascending order of magnitude  $\frac{2}{3}$ ,  $\frac{1}{5}$ ,  $\frac{3}{7}$  and  $\frac{4}{9}$

- A.  $\frac{1}{5}$ ,  $\frac{4}{9}$ ,  $\frac{3}{7}$  and  $\frac{2}{3}$   
B.  $\frac{2}{3}$ ,  $\frac{1}{5}$ ,  $\frac{3}{7}$  and  $\frac{4}{9}$   
C.  $\frac{1}{5}$ ,  $\frac{3}{7}$ ,  $\frac{4}{9}$  and  $\frac{2}{3}$   
D.  $\frac{1}{5}$ ,  $\frac{2}{3}$ ,  $\frac{3}{7}$ ,  $\frac{4}{9}$

56. The term H.C.F means ...

- A. Highest Common Fraction  
B. Highest Combined Factor  
C. Highest Combined Fraction  
D. Highest Common Factor

57. Expands  $(1 - d)^2$

- A.  $d^2 - 2d - 1$   
B.  $d^2 - 2d + 1$   
C.  $d^2 + 2d + 1$   
D.  $d^2 + 2d - 1$

58. Given that  $a = 1$ ,  $b = 2$  and  $c = 3$ , find the value of  $ab - bc$ .

- A. -11      B. -4      C. 4      D. 11

59. Simplify:  $b + 2b - 3b + 4b$

- A. 10b      B. 9b      C. 5b      D. 4b

60. Simplify and express your answer in standard form:  $200 \times 5,000$

- A.  $1.0 \times 10^5$   
B.  $1.0 \times 10^6$   
C.  $2.5 \times 10^5$   
D.  $2.5 \times 10^6$

50 out of 60  
= 83%

## SECTION B - THEORY

INSTRUCTION: Answer all questions in this section. Show all workings.

1. (a) Solve the equation  $\frac{2t + 5}{t - 2} = \frac{7}{2}$

(b) Convert  $1111001.1101_{\text{two}}$  to base ten.

2. (a) Simplify  $6\frac{1}{2} \times \left\{ \frac{8/9}{13/18} \right\} + \left\{ \frac{3}{4} \right\}^2$  of  $3^{1/5}$

(b) Make  $k$  the subject of the formula:  $T^2 = 4\pi(h^2 + k^2) / hg$

3. (a) The angle of elevation of the top of the church tower is  $32^\circ$ . If the tower is 36m above the ground, how far from the church is the point at which the elevation was taken. (Take  $\tan 32^\circ = 0.62$ ,  $\cos 32^\circ = 0.85$ ,  $\sin 32^\circ = 0.52$ ). Correct to two decimal places

(b) Rewrite these fractions in ascending order  $\frac{3}{13}$ ,  $\frac{1}{4}$ ,  $\frac{1}{7}$

4. (a) Find the square root of 3136  
(b) The following items were bought from the market by a house wife at the price indicated

| Items | Amount (₦) |
|-------|------------|
| Beans | 1,800.00   |
| Meat  | 1,200.00   |
| Yam   | 1,000.00   |
| Rice  | 2,000.00   |

Draw a pie-chart to illustrate the information.

15  
- 10  
+ 1  
39

$$\begin{aligned}
 & 1 \times 2^{10} + 1 \times 2^9 + 1 \times 2^8 + 1 \times 2^7 + 0 \times 2^6 + 0 \times 2^5 + 1 \times 2^4 + 1 \times 2^3 \\
 & 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 \\
 & = 1 \times 20 + 1 \times 18 + 1 \times 16 + 1 \times 14 + 0 + 12 + 0 + 10 + 1 \times 8 \\
 & \quad + 0 + 12 + 0
 \end{aligned}$$

$$2a \quad 6\frac{1}{2} \times \left[ \frac{8/9}{13/18} \right] + \left[ \frac{3}{4} \right]^2 \text{ of } 3\frac{1}{2}$$

Bodmas

star bracket first

$$8/9 \div 13/18$$

$$\frac{8}{9} \times \frac{18}{13} = \frac{16}{13}$$

$$6\frac{1}{2} \times \left[ \frac{16}{13} \right] + \left[ \frac{3}{4} \right]^2 \text{ of } 3\frac{1}{5}$$

$$\left[ \frac{3}{4} \right]^2 = \frac{3}{4} \times \frac{3}{4} = \left[ \frac{9}{16} \right]$$

$$6\frac{1}{2} \times \left[ \frac{16}{13} \right] + \left[ \frac{9}{16} \right] \text{ of } 3\frac{1}{5}$$

$$\frac{13}{2} \times \left[ \frac{16}{13} \right] + \frac{9}{16} \text{ of } \frac{16}{5}$$

$$\left[ \frac{9}{16} \times \frac{16}{5} \right] + \frac{13}{2} \times \frac{16}{13}$$

$$\frac{9}{5} + \frac{8}{1} = \frac{9+40}{5} = \frac{49}{5} = 9\frac{4}{5}$$

$$\frac{3 + \frac{3x}{4} = \frac{30}{1}}{1}$$

$$12 + 3x = 120$$

$$3x = 120 - 12$$

$$3x = 108$$

$$x = \frac{108}{3} = 36$$

$$\frac{5}{4} \times 120 = 150$$

$$3 + \frac{90}{4} = 30$$

$$3 + \frac{108}{4} = 30$$

$$3 + 27 = 30$$