UMMUL QURA HIGH SCHOOL
AROWONA BUS-STOP, AMULOKO-AKANRAN ROAD, IBADAN.
2020/2021 THIRD TERM EXAMINATION

SUBJECT: Mathematics DURATION : 3hrs
CLASS: SS1 INSTRUCTION: Attempt section A and B

SECTION A: OBJECTIVES

1. Given that A = {3, 4, 5, 6}, B = {3, 5, 7, 9, 11}. Find A ∪ B.
   A. {3, 4, 5, 6, 7, 9, 11}
   B. {3, 3, 5, 4, 5, 6, 7, 9}
   C. {3,3, 4, 5, 6,7,9,11}
   D. {3, 4, 5,5, 7, 9,11}
2. Which of the following is an empty set?
   A. {month beginning with A}
   B. {month beginning with K }
   C. {Days beginning with S }
   D. {None of the above}
3. Given that set {9, 10, 11}, find all the possible sub-sets.
   A. {9}, {10}, {11}, {9,10}, {9, 11}, {10, 11}, {φ} and {9, 10, 11}
   B. {9},{10}, {11}
   C. {9}, {10}, {11}, {9, 10}, {9, 11}, {10, 11}, {9, 10, 11}
   D. {9, 10}, {9, 11}, {10, 11},{φ}, and {9, 10, 11}
4. Given the set B = {1, 2, 3, 4}, C = {g, b, c, e}. Find B ∪ C.
   A. {1, 2, 3, 4, g, b}
   B. {g, b, c, e}
   C. {1, 2, 3, 4}
   D. {1, 2, 3, 4, g, b, c, e}
5. Let A = {a, b, c, d, e, f} and B = {a, e, i, o, u}. Find A ∩ B.
   A. {a, b, c}
   B. {a, e}
   C. {a, o}
   D. {o, u}
6. Given a universal set N = {x : 2 ≤ x ≤ 5} where X is an integer and the subset A = {x : 1 < x < 4} and B = {x : -1 ≤ x < 3}. A ∩ B is
   A. {2, 3, 4}
   B. {2, 3}
   C. {-1, 0, 1, 2}
   D. {2}
7. If A = {11, 12, 13, 14} and B = {w, x, y, z}. A ∩ B is
   A. {11, 12, 13, 14}
   B. {w, x, y, z}
   C. { }
   D. {11, 12, 13, 14, w, x, y, z}

   Let N = {a, b, c, d, e, f, g, h}, A = {a, b, c, d} B = {b, d , f, h}. use the above to answer question 8 – 9

8. $(A \cup B)^I$ is
   A. {a, b, c, d, f, h}
   B. {e, g}
   C. {a, b, c, d}
   D. {c, d, f, h}
9. $(A \cap B)^I$ is
   A. {a, c, e, f, g, h}
   B. {b, d}
   C. {f, g, h}
   D. {a, c, e, f}
10. In a class of 40 students a student can study French or History or both. If 20 study French, 23 study History

and 6 study neither, how many students study both subjects?

A. 40
B. 20
C. 23
D. 9

11. Make g the subject of the formula in the equation: $T = 2\pi\sqrt{\frac{h+k}{gh}}$

A. $4\pi^2(h^2 + k^2)$
B. $\frac{4\pi^2(h^2 + k^2)}{ht^2}$
C. $\frac{h^2 + k^2}{gh}$
D. $\sqrt{\frac{h^2 + k^2}{gh}}$

12. $V = \frac{1}{3}\pi r^2 h$ is the volume of a circular cone of base radius r and length h. make r the subject of the formular and find r when the volume is $898\frac{1}{3}$ cm^3 and h = 70cm. (Take π = 22/7).

A. $3\frac{1}{2}$
B. 3
C. $\frac{14}{2}$
D. 8

13. If P varies directly as R, and R = 12 when P is 10, find the relationship between P and R.

A. $P = \frac{5}{6}R$
B. $R = \frac{5}{6}R$
C. $P = \frac{6}{5}R$
D. $P = \frac{10}{15}R$

14. P is inversely proportional to Q and P = 5 when Q = 4. What is the value of Q when P = 25.

A. 20
B. $\frac{4}{5}$
C. $\frac{6}{4}$
D. 5

15. If m varies directly as n and inversely as the square of P. If m = 3 when n = 2 and p = 1, find m in term of n and p

A. $n = \frac{3m}{p^2}$
B. $m = \frac{n}{p^2}$
C. $m = \frac{3n}{2p^2}$
D. $\frac{3p^2}{4n}$

16. Factorize $X^2 + 9x + 14$.

A. (x + 3)(x + 5)
B. (x + 3)(x + 6)
C. (x + 2)(x + 7)
D. (x + 4)(x + 5)

17. Factorize $16y^3 + 16y^2 + 4y$

A. (2y + 1)(2y + 2)
B. (2y + 4)(2y + 4)
C. 4y(2y + 1)(2y + 1)
D. (y + 1)(y + 16)

18. Factorize $12x^2y^2 + 11xy - 1$

A. (xy -1)(12xy + 1)
B. (y -1)(12x + 1)
C. (xy -2)(10xy + 1)
D. (xy -1)(12xy + 2)

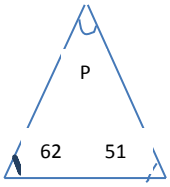
19. Factorize $16h^3 + 16h^2 + 4h$

A. 4h(2h +2)(2h + 1)
B. (2h + 1)(2h + 1)
C. 4h(2h + 1)(2h + 1)
D. 2h(2h + 1)(2h + 1)

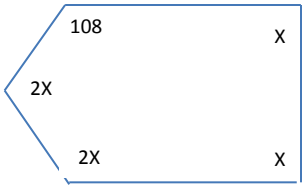
20. Factorize 27p2 – $3q^2$

A. (3p -q)(3p –q)
B. 3(3p -q)(3p + q)
C. (3p + q)(3p + q)
D. 3(3p + q)(3p + q)

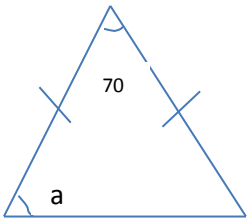
21. Construct a quadratic equation whose roots are $\frac{-2}{5}$ and $\frac{1}{3}$ respectively.
    A. $3t^2 + t - 2 = 0$
    B. $15t^2 + t - 2 = 0$
    C. $4t^2 + 3t - 2 = 0$
    D. $t^2 + t - 2 = 0$
22. find the missing angles



    A. 57
    B. 62
    C. 51
    D. 67
23. A chord is drawn 3cm away from the centre circle of radius 5cm. calculate the length of the chord.
    A. Length of the chord = 2cm
    B. Length of the chord = 4cm
    C. Length of the chord = 3cm
    D. Length of the chord = 5cm
24. what is the sum of the interior angles of a dodecagon?
    A. 180^0
    B. 1800^0
    C. 170^0
    D. 18^0
25. a regular polygon has an interior angle equal to 168^0. The number of sides it has is
    A. 14
    B. 16
    C. 17
    D. 12
26. A polygon has the following interior angles: y^0, $(y + 10)^0$, $(y + 20)^0$, $(y + 30)^0$, $(y + 40)^0$ and $(y + 50)^0$. The value of y is
    A. 75^0
    B. 85^0
    C. 65^0
    D. 95^0
27. The sum of the angles of a regular polygon is 2520^0. How many sides does the polygon have
    A. 180
    B. 16
    C. 4
    D. 14
28. The sum of the interior angles of a polygon of n sides is 900^0. Find the value of n
    A. 8
    B. 4
    C. 9
    D. 7
29. Find the value of x in the diagram below

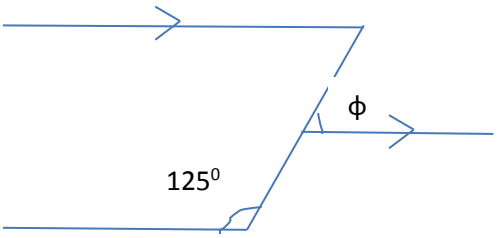


    A. 72
    B. 108
    C. 74
    D. 77
30. The angle marked in the diagram below is



A. 45
B. 70
C. 55
D. 45

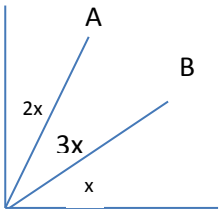
31.



In the above diagram the value of φ is

A. 45
B. 125
C. 65
D. 55

32. The value of x in the diagram is



A. 90
B. 35
C. 15
D. 45

33. The value of x in the worked angle is

A. 54
B. 39
C. 87
D. 77

34. Express 0.0462 in standard form

A. 0.462×10^{-1}
B. 0.462×10^{-2}
C. 4.62×10^{-1}
D. 4.62×10^{-2}

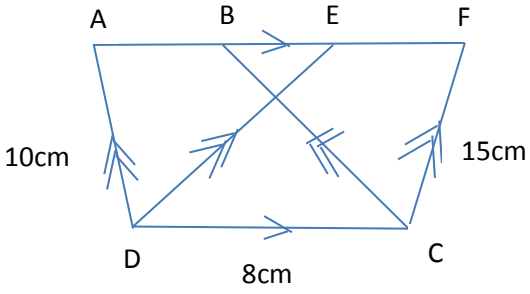
35. The population of a village is 5846. Express this number to three significant figures

A. 5850
B. 5840
C. 5860
D. 5870

36. Simplify : $\left(\frac{1}{4}\right)^{-1\frac{1}{2}}$

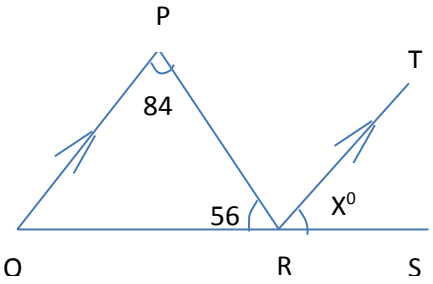
A. $\frac{1}{8}$
B. $\frac{1}{4}$
C. 2
D. 8

37. If the area of DCF = $24cm^3$, Find the area of the quadrilateral ABCD in the diagram below:



A. $24cm^2$
B. $48cm^2$
C. $80cm^2$
D. $96cm^2$

38. In the diagram below, QRS is a straight line, QP//RT, PRQ = 56^0, < QPR =84 and <TRS = X^0. Find x.



A. 28
B. 40
C. 44
D. 84

39. Simplify $r^7 \div r^7$
A. 0
B. 1
C. 2
D. 3

40. Solve $\frac{5^{x+3}}{25^{2x-3}} = 1$
A. 5
B. 3
C. 4
D. 1

41. Simplify $3^{2-1} \times 3^{1-2}$
A. 1
B. 0
C. 2
D. 5

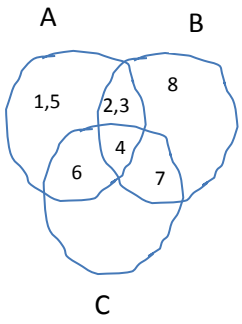
42. Simplify $\frac{8^{2/3} \times 27^{-1/3}}{64^{1/3}}$
A. – 3
B. $^1/_9$
C. $^1/_3$
D. $^{27}/_8$

43. Solve the equation $5x^2 – 4x – 1 = 0$
A. -1, $^1/_5$
B. -1, $^{-1}/_5$
C. 1⅕
D. 1, $^{-1}/_5$

44. Make S the subject of the formula $V = \frac{K}{\sqrt{T - S}}$
A. $S = T - \frac{K^2}{V^2}$
B. $S = \frac{K^2 - T}{V^2}$
C. $S = T - \frac{V^2}{K^2}$
D. $S = \frac{T(V^2 - K^2)}{V^2}$

45. Find the equation whose roots are $^2/_3$ and $^{-1}/_4$
A. $12x^2 + 11x – 2 = 0$
B. $12x^2 – 11x + 2 = 0$
C. $X^2 - \frac{11}{12}x + 2$
D. $X^2 + \frac{11}{12}x - 2 = 0$

46. What is A ∩ B in the diagram below?
A. (2, 3)
B. (2, 3, 4)
C. (1, 2, 3)
D. (2, 3, 8)



47. Simplify $(2\frac{1}{6} - 1\frac{2}{3}) \div 2\frac{2}{3}$

A. $\frac{3}{16}$

B. $\frac{7}{16}$

C. $1\frac{13}{24}$

D. $2\frac{11}{24}$

48. Expand (2x - 5) (x - 3)

A. $X^2 – 1x – 15$

B. $2x^2 – 11x + 15$

C. $2x^2 – 5x – 8$

D. $X^2 – 5x – 15$

49. If 3p – q = 6 and 2p + 3q = 4, find q

A. 0

B. $\frac{1}{2}$

C. $\frac{2}{3}$

D. 1

50. M varies directly as n and inversely as the square of P. if M = 3, when n = 2 and p = 1,find M in terms of n and p

A. $M = \frac{2n}{3P}$

B. $M = \frac{2n^2}{2P^2}$

C. $M = \frac{n^2}{2p}$

D. $M = \frac{3n}{3p^2}$

SECTION B: THEORY PART

INSTRUCTION: ANSWER ANY FOUR QUESTIONS

1a. Verify that $(A \cap B) \cap C = A \cap (B \cap C)$

b. Show that the statement : $[\sim P \wedge (P \vee Q)] \Rightarrow$ Q is a tautology.

c. Show that the statement : $(P \wedge Q) \wedge \sim (P \vee Q)$ is a contraction.

2. The cost of maintaining a car is partly constant and partly varies with the distance travelled in a given month. The cost c for a particular month was #1250 when the distance d travelled was 300km. in another month, the cost was #3500 for a distance of 1200km. find:

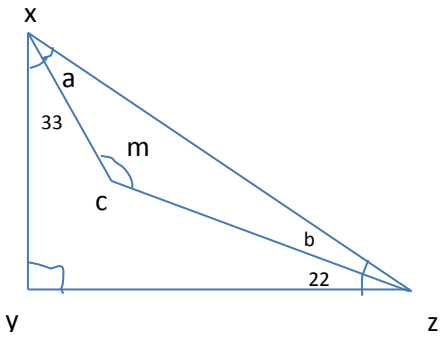
a. the formula connecting c and d.

b. the cost for a journey of 1600km.

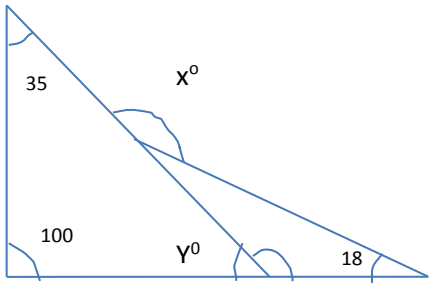
c. make R the subject of the formular in $I = \sqrt{\frac{E}{R^2 + W^2L^2}}$

3a. Prove that the sum of angles of a triangle is two right angle.

b. What is the value of the angle marked m? in the diagram below.



c. Find the marked angle y and x in the diagram below



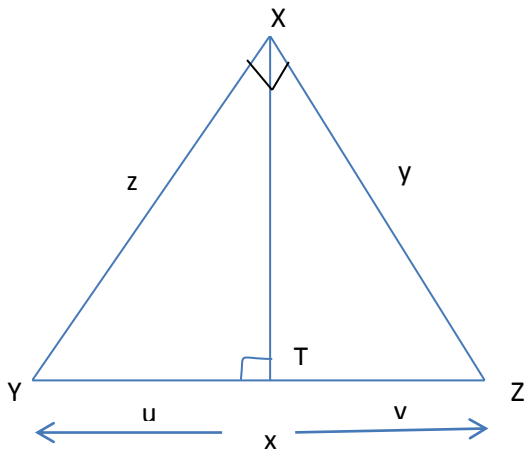
4. In a class of 80 students for a seasonal examination, 34 students study English, 29 study History while 42 study Geography. 12 study English and History, 14 study Geography and History and 8 study English and Geography while 4 students did not study any of the three subjects.

i. how many students study the three subjects?

ii. how many students study any combination of two subjects only?

iii. how many students study at least 2 combination

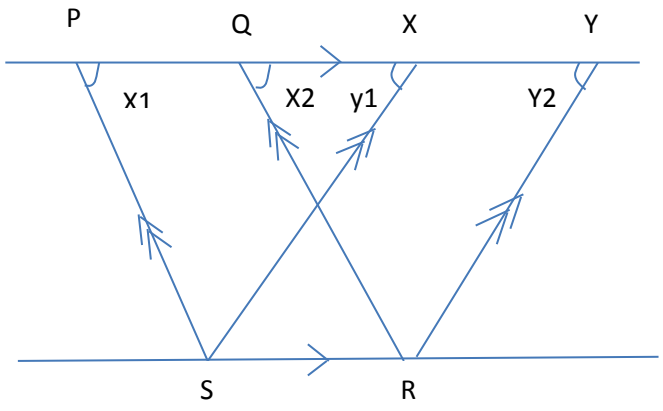
5.



In the diagram above, we are given Δ XYZ with X = 90. YZ, XZ and XY are length, x, y and z unit respectively. Prove that $x^2 = y^2 + z^2$.

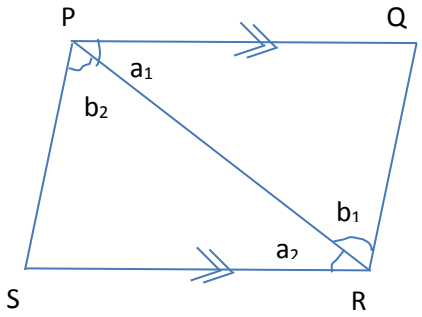
b. ΔABC is right-angled at A and /AB/ = 2/AC/. Prove that $/BC/^2 = 5/AC/^2$

c.



In the parallelogram PQRS and XYRS above, are on the same base SR and between the same parallel PY, SR. Prove that PQRS = XYRS.

6a.

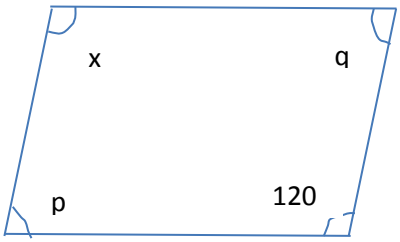


In the diagram above prove that:

(i) opposite side are equal

(ii) the opposite angles are equal

b. Find the angles p, q, x in the diagram below:



c. Prove that /PX/ = /XR/, /QX/ = /XS/ in the diagram below