Zenith Program (Std X)
Preparatory Program – NTSE Stage 1
Year 2018 Test Paper - SAT

Max Marks – 100 Time – 2 Hrs

SUCCESS – It all depends on YOU.

1. Value of acceleration due to gravity on earth is maximum at _____.

(A) Poles (B) Equator

(C) Depth of 60 km below earth's surface

(D) Height of 400 km above earth's surface

2. Magnetic field due to current through a _____ is similar to magnetic field produced by a bar magnet.

(A) Circular loop of conducting wire

(B) Rectangular loop of conducting wire

(C) Solenoid (D) Thick copper wire

3. Choose the wrong statement related to refraction of light

(A) Twinkling of stars

(B) Oval shape of sun in morning and evening

(C) Object in water appears bigger in size

(D) Red light undergoes dispersion, while passing through prism

4. How much time the satellite will take to complete one revolution around the earth, if velocity of satellite is 3.14 km/s and its height above earth's surface is 3600 km (Radius of earth is 6400 km)

(A) 2000 S (B) 20000 S

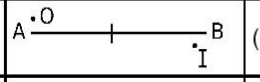
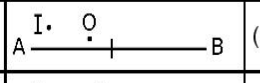
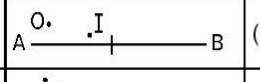
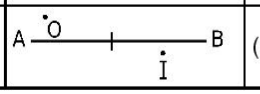
(C) 1000 S (D) 10000 S

5. A planet in an orbit sweeps out an angle of 160° from March - May, When it is at an average distance of 140 million km from sun. If the planet sweeps out an angle of 10° from October - December, then the average distance from sun is

(A) 56 x 10^5 km (B) 56 x 10^6 km

(C) 56 x 10^7 km (D) 56 x 10^8 km

10. Observing the following table, choose the correct alternative

	Column I		Column II
(A)		(i)	Image formed by concave lens
(B)		(ii)	Image formed by convex lens with object at $2F$
(C)		(iii)	Image formed by convex lens with object beyond $2F$
(D)		(iv)	Image formed by convex lens with object within focal length

In Column I AB- Principal axis of lens, O - point object, I - point image. Match the two Columns.

(A) A - (i), B - (ii), C - (iii), D - (iv)

(B) A - (iii), B - (i),C - (iv), D - (ii)

(C) A - (iv), B - (iii), C - (ii), D - (i)

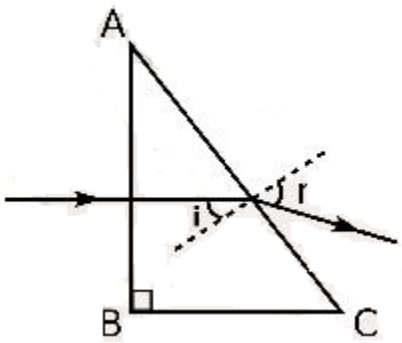
(D) A - (ii), B - (iv), C - (i), D - (iii)

7. How much heat energy in Joules is necessary to raise the temperature of 5kg of water from 20° to 100°?

(A) 1672 KJ (B) 167200 J

(C) 16720 J (D) 1672 J

8. A ray falls on a prism ABC(AB = BC) and travels as shown in figure. If refractive index of glass with respect to air is 1.5, find sin r.



(A) $\frac{3}{\sqrt{2}}$

(B) $\frac{3}{2\sqrt{2}}$

(C) $\frac{\sqrt{2}}{3}$

(D) $\frac{2\sqrt{2}}{3}$

9. In a Helium gas discharge tube every second 40 x 10^{18} He^{+} (ions) move towards the right through a cross-section of the tube, while n, electrons move to the left in the same time. If the current in the tube is 8 A towards right then n = ?

(A) 3 x 10^{18} (B) 3 x 10^{19}

(C) 3 x 10^{20} (D) 3 x 10^{21}

10. Device/devices changing electrical energy into mechanical energy is/are _____

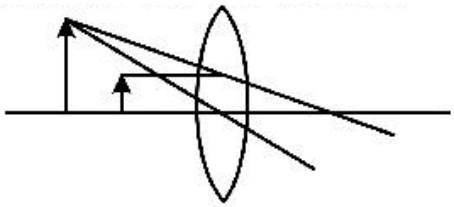
(I) Electric generator (II) Electric motor

(III) Voltmeter (IV) Ammeter

(A) (I) and (II) (B) (II) and (III)

(C) (II), (III) and (IV) (D) Only (II)

11. A convex lens produced an image of an object on a screen with a magnification of $\frac{1}{2}$ When the lens is moved 30 cm away from the object, the magnification of the image is 2. The Focal length of the lens is



(A) 20 cm

(B) 25 cm

(C) 30 cm

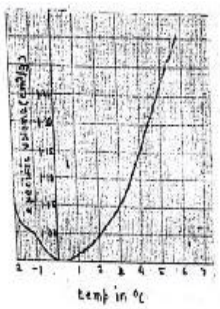
(D) 35 cm

12. Two plane mirrors at an angle (x°) produces 5 images of a point. The number of images produced when x° is decreased to (x - 30°) is

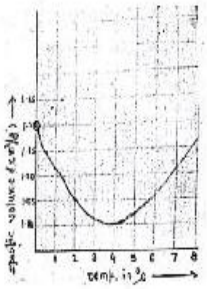
(A) 9 (B) 10 (C) 11 (D) 12

13. Choose the correct diagram (graph) showing anomalous bahaviour of water.

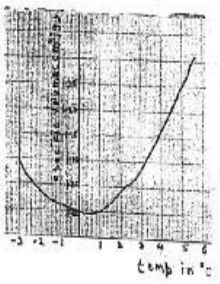
(A)



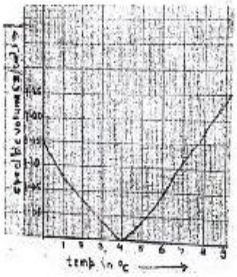
(B)



(C)



(D)



14. In which year National Chemical laboratory, Pune was established?

(A) 1950 (B) 1995 (C) 2005 (D) 1989

15. Which is the chemical formula of red oxide?

(A) Fe_2O_3 (B) FeO_3

(C) FeO (D) FeO_2

16. In water purification fullerene is used as _____.

(A) Fuel (B) Insulator

(C) Catalyst (D) Reductant

17. Which block elements are called transition elements?

(A) s - block (B) p - block

(C) d - block (D) f - block

18. What is chemical formula of rust on Iron?

(A) Fe_20_3 (B) $Fe_20_3H_20$

(C) FeO (D) $Fe0_2$

19. What is the percentage of Al_2O_3 is Bauxite?

(A) 30% to 70% (B) 35% to 70%

(C) 30% to 75% (D) 70% to 75%

20. Chemical formula of lime stone is _____

(A) $Ca(OH)_2$ (B) $CaC0_3$

(C) $CaCl_2$ (D) CCl_4

21. What is the condensed structural formula of alcohol?

(A) -OH (B) -CHO (C) -COOH (D) $-NH_2$

22. In which of the following elements does not consist isotopes?

(A) Carbon (B) Neon (C) Chlorine (D) Iodine

23. In which of the following ink silver nitrate is used?

(A) Voting ink (B) Writing ink

(C) Printing ink (D) Marker pen ink

24. To prevent the misuse of the important commercial solvent ethanol is mixed with

(A) Methanol (B) Propanol

(C) Ethanoic acid (D) Propane

25. Chemical formula of cryolite is _____

(A) NaAlF (B) Na_3AlF_6

(C) Na_2AlF_3 (D) Na_2AlF_2

26. Which of the following is not Dobereiner's Traides?

(A) Li, Na, K (B) Cl, K, Cr

(C) Ca. Sr, Ba (D) Cl, Br, I

27. By using only one of the strands of DMA, mRNA is produced. This process is called as _____

(A) Transcription (B) Translation

(C) Translocation (D) Replacement

28. Identify phase in mitosis shown by : centromeres split and thereby sister chromatids of each chromosome separates and they are pulled apart in opposite direction

(A) Telophase (B) Prophase

(C) Metaphase (D) Anaphase

29. If the embryonic cells are divided into two groups 8 days after the zygote formation then there is high possibility of formation of

(A) Genetically different twin girls

(B) Siamese twins

(C) Genetically different twin boys

(D) Genetically different one boy one girl

30. Which is the sequence of four whorls of flower from outside to inside?

(A) Calyx → corolla → androecium → gynoeceium

(B) Gynoeceium → androecium → corolla → calyx

(C) Calyx → androecium → corolla → gynoeceium

(D) Gynoeceium → corolla → androecium → calyx

31. Sunderban sanctuary of West Bengal is reserved for which animals?

(A) Rhino (B) Bison (C) Tiger (D) Asiatic lion

32. From the following which animal is warm blooded, presence of mammary glands and body divided into head, neck, trunk and tail.

(A) Penguin (B) Tortoise (C) Pigeon (D) Bat

33. In process of fermentation of production of wine from grapes which micro organism is used?

(A) Saccharomyces cerevisiae

(B) Aspergillus oryzae

(C) Lactobacillus brevis

(D) Aspergillus niger

34. Given below pairs proteins of produced by biotechnology and disease they are used against. Find the odd pair.

(A)

Proteins produced	Diseases
Insulin	Diabetes

(B)

Erythropoietin	Anemia

(C)

Interleukin	Cancer

(D)

Interferon	Hemophilia

35. Which factor from the following decreases efficiency of nervous system, liver as well as lifespan of person

(A) Tobacco (B) Gutkha

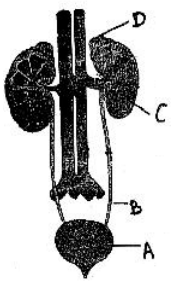
(C) Alcohol (D) Stress

36. Who is responsible at the district level disaster management and implementation of rehabilitation schemes?

(A) Chief Minister (B) Home Minister

(C) Collector (D) Tahsildar

37. Identify the adrenal gland from the following figure.



(A) A

(B) B

(C) C

(D) D

38. Identify the correct sequence for process of energy production from carbohydrates.

(A) Carbohydrates → Glycolysis → Pyruvic acid → AcetylCoA → Krebs cycle → $CO_2 + H_2O$ + energy

(B) Carbohydrates → Glycolysis → Pyruvic acid → Krebs cycle → AcetylCoA → $CO_2 + H_2O$ + energy

(C) Carbohydrates → Glycolysis → AcetylCoA → Pyruvic acid → Krebs cycle → $CO_2 + H_2O$ + energy

(D) Carbohydrates → Glycolysis → AcetylCoA → Krebs cycle → Pyruvic acid → $CO_2 + H_2O$ energy

39. Identify the function of columnar epithelium.

(A) Selective transport of substances

(B) Prevention of wearing of organs

(C) Secretion of digestive juice ' |

(D) Reabsorption of useful materials from urine

40. Body structure of different animals is given below. Identify to which phylum the animal belongs.

I. Long, cylindrical, metamerically segmented

II. Triploblastic, bilaterally symmetrical, eucoelomate.

III. They have setae or parapodia or suckers for locomotion.

(A) Arthropoda (B) Annelida

(C) Aschelminthes (D) Mollusca

41. Who was the founder of modern Historiography?

(A) Voltair (B) Michel Foucault

(C) Karl Marx (D) Rene Descartes

42. Identify the wrong pair from the pairs given below.

(A) Who were the shudras - H istory of Subaltern

(B) Stri - Purush Tulana - Feminist writing

(C) Cambridge History of India - Colonial Historiography

(D) The Indian war of Independence - Marxist History

43. The main office of National film Archives of India is at.....

(A) Mumbai (B) Pune (C) Kolkata (D) Delhi

44. Identify the style of the temple architecture that has been shown in the above picture?

(A) Dravid

(B) Vesara

(C) Nagara

(D) Bhoomija

45. Who started the First English Newspaper in India?

(A) Alen Hume (B) Sir John Marshal

(C) James Augustus Hickey (D) Micne| Foucault

46. Who is known - as the first Keertankar of Maharashtra?

(A) Saint Dyaneshwar (B) Saint Tukaram

(C) Saint Namdev (D) Saint Eknath

47. Write the name of the Wooden dolls made in Maharashtra.

(A) Thaki (B) Kali Chandika

(C) Gangavati (D) Champavati

48. 'Bhilar' - the village near Mahableshwar is famous as the 'village of.....'

(A) Plants (B) Books (C) Forts (D) Mangoes

49. Identify the wrong pair from the famous museuns and its location in India.

(A) Kolkata-Indian Museum

(B) Delhi - National Museum

(C) Hyderabad - Salarjang Museum

(D) Mumbai - The calico Museum of Textiles

50. Who said that,' the prevailing practive of arranging historical events in a chronological order is not right?'

(A) Michel foucault (B) SeamawThe Bolva

(C) Leopold von Ranke

(D) George Wilhelm friendrich Hegel

51. Which style of architecture has been used to build,' Chhatrapati Shivaji Maharaj Raiway Terminus'?

(A) Muslim (B) Nagara

(C) Dravid (D) Indo-Gothic

52. 6th January is celebrated as ..... Day.

(A) Right to Information (B) Journalist

(C) Human rights (D) Cleanliness

53. ..... is the birth date of Major Dhyan Chand is celebrated as the 'National Sports Day' in India.

(A) 28 October (B) 29 August

(C) 10 December (D) 14 April

54. Under the leadership of socialist leader ..... women in Mumbai participated in a demonstration which came to be known as 'Laatne Morcha'

(A) Pramila Dandavate (B) Mrinal Gore

(C) Gaura Devi (D) Dr. Phulrenu Guha

55. Which industry is known as 'Sunrise Sector' of India?

(A) Jute Industry (B) Automobile Industry

(C) Cement Industry (D) Khadi and village industry

56. In the year 1983, The Indian cricket team won the World Cup under the captainship of .....

(A) Sunil Gavaskar (B) Sandip Patil

(C) Sayyed Kirmani (D) Kapil Dev

57. Several attempts were made towards democratic decentralisation. One of these attempts was the ..... amendment to Indian constitution.

(A) 71 and 72 (B) 72 and 73

(C) 73 and 74 (D) 74 and 75

58. Identify the article of the Indian Constitution, which has established Election Commission as autonomous body?

(A) Art. -314 (B) Art. -324

(C) Art. - 334 (D) Art. -344

59. Who appoints the Election Commissioner in India? -

(A) President (B) Prime Minister

(C) Speaker of Loksabha (D) Voice President

60. Which one of the following is incorrect/ wrong pair in concern with the region &the movement raised in it?

(A) Chota Nagpur - Ramoshi (B) Orissa - Gond

(C) Maharashtra- Koli (D) Bhihar- Munda

61. Which one of the following is irrelevant to the challenges faced by the Indian Democracy?

(A) Terrorism (B) Corruption

(C) Naxlism (D) Environment Degradation

62. The essence of Democracy is .....

(A) Universal Adult Franchise

(B) Decentralisation of Power

(C) Policy of reservation of seats

(D) Judicial decisions

63. Identify the Nation which is not a Member of 'ERICS'- an International Organization?

(A) India (B) England (C) China (D) Russia

64. In 2005 The India U.S. Civil Nuclear Agreement was signed by ..... the Prime Minister of India and George W. Bush - the American President

(A) Rajiv Gandhi (B) P. V. Narsimha Rao

(C) Dr. Manmohan Singh (D) Atal Bihari Vajpayee

65. India has no coastline along the ..... direction.

(A) East (B) West (C) South (D) North

66. Identify the oddman out

(A) Snow (B) Hailstone (C) Ice (D) Rainfall

67. Though India has a higher national income as compared to Brazil, the per capita income of India is lower than Brazil because .....

(A) The Population of India is more

(B) The Population of India is less.

(C) The Population of Brazil is more.

(D) The Population of Brazil and India is equal.

68. Identify the wrong statement, regarding Importance of Population .....

(A) Expansion of trade

(B) Rapid Industrialization

(C) Tourism Development

(D) Lack of employment opportunities

69. India too has a large longitudinal extent. The difference between the two extreme most points is .....

(A) 110 (B) 120 (C) 130 (D) 140

70. Find out the odd man out from given options

(A) Ganga (B) Sabarmati

(C) Sindhu (D) Yamuna

71. Which type of settlement has been found at the uneven topography of Himalaya?

(A) Nucleated (B) Linear

(C) Dispersed (D) Star-Shaped

72. Which one is not the mean of Communication?

(A) Computer (B) Mobiles

(C) Internet (D) Encyclopeadia

73. Identify the correct option from pairs given below.

	State		Travel Place
(A)	Maharashtra	(I)	Udagmandalam
(B)	Rajasthan	(II)	Masoori
(C)	Uttarakhand	(III)	Aajintha
(D)	Tamilnadu	(IV)	Jaisalemer

(A) A - III, B - IV, C - II, D - I

(B) A - IV, B - III.C - I, D - II

(C) A - II, B - I, C - III, D - IV

(D) A - I, B - II, C - IV, D - I

74. Which country do not share their border with Brazil?

(A) Argentina (B) Myanmar

(C) Peru (D) French Guiana

75. Identify the correct options of pairs given below.

	'A' Group		'B' Group
(A)	Temperate Grasslands	(I)	Savanna
(B)	Thorny Shrubs	(II)	Amazon River Basin
(C)	Tropical Grasslands	(III)	Coatinga
(D)	Equatorial forests	(IV)	Pampas

(A) A - I, B - II,C - IV, D - lll

(B) A - II, B - IV, C - lll, D - I

(C) A - III, B - I, C - II, D - IV

(D) A - IV, B - III, C - I, D - II

76. Which river has been shown with letter 'A' in the given outline map of Brazil?

(A) Paraguay

(B) Paraniba

(C) Urugway

(D) Purus

77. ..... is a large coastal island located between the mouths of River Amazon and River Tocantins.

(A) Sao Francisco (B) Marajo

(C) Marcos (D) Rio

78. Identify the correct option of pairs given below:

Group 'A' Region	Group 'B' Average Rain fall	Group 'C' Type of Forest
(A) Giana Highlands (B) Amazon Basin (C) Paraguay-Parana Basin (D) Brazilian Highland	(I) 1500 mm (II) 600 mm (III) 1600 mm (IV) 2000 mm	(P) Temperate Grasslands (Q) Deciduous Forests (R) Tropical Forests (S) Equatorial Forests

(A) A - III - R, B - IV - S, C - I - Q, D - II - P

(B) A - IV - S, B - III - R, C - II - P, D - I - Q

(C) A - I - P, B - II - Q. C - III - R, D - IV - S

(D) A - II - Q, B - I - P.C - IV - S, D - III - R

79. Choose the correct option of favaurable factors for highest population density.....

(A) Fertile land - plain lands - availability of water

(B) Fertile land - agriculature development - dry desert area

(C) Plain lands- development of industry- hilly regions

(D) Hilly regions - dense forest area - fertile land

80. In which district of Meghalaya - the highest rainfall place Mawsynram is situated?

(A) Garo (B) Jaitiya (C) Khasi (D) Dispur

81. Which of the following two linear equations have only one unique solution x = 2 and y = -3

(A) x + y = -1; 2x - 3y= -5

(B) 2x + 5y = -11; 4x + 10y = 22

(C) 2x – y = 1; 3x + 2y = 0

(D) x - 4y - 14 = 0: 5x - y - 13 = 0

82. If $\alpha+\beta=-3$ and $\alpha\beta=-\frac{5}{2}$ then find the quadratic equation whose roots are ∝ and β?

(A) $2x^2 - 5x + 6 = 0$ (B) $2x^2 - 6x + 5 = 0$

(C) $2x^2 + 6x - 5 = 0$ (C) $2x^2 - 6x - 5 = 0$

83. What is the probability of having 53 Thursday in ordinary year (except leap year) ?

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

84. How many natural numbers between 15 to 500 when divided by 6 leave remainder 5?

(A) 81 (B) 81 (C) 82 (D) 83

85. $\begin{vmatrix} \frac{5}{3} & \frac{7}{2} \\ \frac{3}{4} & \frac{3}{2} \end{vmatrix}$ Choose correct alternative for the value of determinant.

(A) $\frac{1}{8}$ (B) $\frac{-1}{8}$ (C) $\left(\frac{-1}{2}\right)^3$ (C) $\frac{-1}{\sqrt[3]{512}}$

(A) (1) and (3) (B) (2), (3) and (4)

(C) (1), (2) and (3) (D) (1), (3) and (4)

86. If roots of the quadratic equation $3ax^2 + 2bx + c = 0$ are in the ratio 2 : 3 then which of the following statement is true?

(A) 8ac = 25b (B) $8ac = 9b^2$

(C) $8b^2 = 9ac$ (D) $8b^2 = 25ac$

87. In Arithmetic Progression there are n terms(n is odd) and middle term is m then what Sn = ?

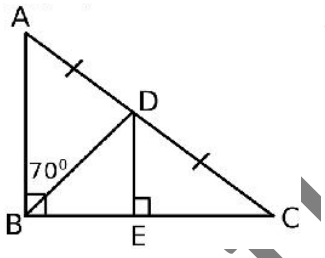
(A) $\frac{mn}{2}$ (B) mn (C) $2mn$ (D) mn^2

88. If N = 70, h = 10, c.f. = 22, f = 10, L= 30 then using this information find median ?

(A) 42 (B) 45 (C) 43 (D) 34

89. Two dice are rolled simultaneously, what Is the probability of getting sum of the digits on the upper face as a prime number?

(A) $\frac{5}{36}$ (B) $\frac{5}{12}$ (C) $\frac{5}{18}$ (D) $\frac{11}{36}$



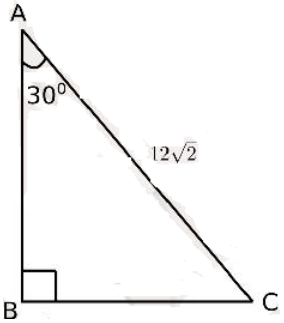
90. The number formed when 5 is subtracted after multiplying by 8 to the sum of digits of a two digit number is equal to the number formed when 3 is added after multiplying by 16 to the difference of digits in a number. What is the number?

(A) 83 (B) 84 (C) 85 (D) 78

91. In the adjoining figure ∆AZJC is a right triangle. Point D is the midpoint of hypotenuse AC. Segment DE ⊥ side BC. m∠ABD = 70° then find m∠CDE - rn∠DBE =?

(A) 70° (B) 20° (C) 50^0 (D) 30°

92. Observe the adjoining figure. From the given information the perimeter of the triangle is given below. Choose the correct alternative.



$(A)\ \left(18\sqrt{2}+6\sqrt{6}\right)$ $(B)\ \left(6\sqrt{3}+12\sqrt{2}\right)$

$(C)\ \left(18+6\sqrt{3}\right)\sqrt{2}$ $(D)\ \left(18+6\sqrt{6}\right)\sqrt{2}$

(A) A and B (B) A and C

(C) C and D (D) Only D

93. Read the following statements carefully and choose the correct alternative.

(1) The ratio of the circumference of a circle to its diameter is denoted by the Greek letter π

(2) π is non-terminating, recurring decimal fraction and its exact value is $\frac{22}{7}\left(\pi = \frac{22}{7}\right)$

(A) Statements 1 and 2 false

(B) Statements 1 and 2 correct

(C) Statements 1 correct but 2 false

(D) Statements 1 false but 2 correct

94. Read the following statement carefully and choose the correct alternative.

(1) The slope of the line parallel to X - axis can be derived by the formula $\frac{x_2 - x_1}{y_2 - y_1}$

(2) The slope of the line parallel to Y - axis is 1

(3) The contangent ratio of an angle made by the line with the positive direction of X-axis is called the slope of that line.

(4) The slope of the line which makes acute angle with X-axis is less than zero and the slope of the line making obtuse angle with X-axis is greater than zero.

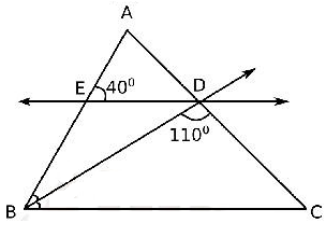
(A) Statement 1 and 2 correct

(B) Statement 3 and 4 correct

(C) Only statement 3 is wrong

(D) All the statements are wrong

95. In the adjoining figure ray BD bisects $\angle$ABC of ΔABC seg ED || side BC m$\angle$AED = 40^0 and m $\angle$BDC = 110^0 and then find the measurements of $\angle$EDB and $\angle$DCB respectively. Choose the correct alternative from the following.



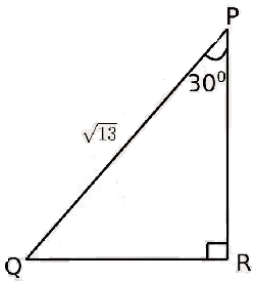
(A) 20° and 50°

(B) 50° and 20°

(C) 40° and 50

(D) 40° and 70°

96. In ΔPQR M$\angle$R = 90^0, M$\angle$ P = 30^0. PQ = $\sqrt{13}$ From the given information find the value of cosec60^0 – sec 60^0?



(A) $\left(\frac{2}{\sqrt{3}} - \frac{1}{\sqrt{3}}\right)$ (B) $\left(\frac{\sqrt{13}}{2} - \frac{\sqrt{39}}{2}\right)$

(C) $\left(\frac{\sqrt{39}}{2} - \frac{\sqrt{13}}{2}\right)$ (D) $2\left(\frac{1}{\sqrt{3}} - 1\right)$

97. In right angled triangle ABC $\angle$B = 90° ΔABC is in the first and second quadrant on the graph paper. The coordinator of the points A and C are (2, 5) and (-2, 3) respectively. Find the possible pairs of co-ordinates of point B from the following alternatives.

(A) (-2, 5) or (2, 3) (B) (5, -2) or (3,2)

(C) (-2, 2) or (5, 3) (D) (2, -2) or (5, 3)

98. Choose the correct figure that has all the following properties :

(A) Both the diagonals are congruent

(B) It is called as rectangle

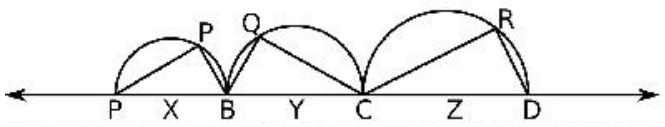
(C)The perimeter of the figure is four times its length or breadth

(D) It is rhombus

(A) Rhombus (B) Rectangle

(C) Trapezium (D) Square

99.

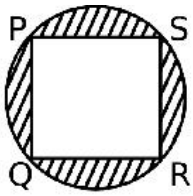


In the figure, semi-circles are drawn whose centre are X, Y, Z respectively. Points (X, Y, Z); are collinear points (X - Y Z) AX = 2.5, BY = 6.5. CZ = 8.5 and AP+

QC = 16; QC + CR = 27 and CR + AP = 19 then find the value of AP + PB + BQ + QC + CR + RD = ?

(A) 37 (B) 41 (C) 53 (D) 47

100.



In the figure PQRS is a cyclic quadrilateral. If the area of the shaded part is $\frac{72}{7}$ sq.ujiits then find the radius of the circle.

(A) $\sqrt{7}$ units (B) 4 units

(C) 3 units (D) 2 units

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