Sample Question Paper - 2
Class- IX Session- 2021-22
TERM 1
Subject- Mathematics

Time Allowed: 1 hour and 30 minutes **Maximum Marks: 40**

General Instructions:

1. The question paper contains three parts A, B and C.
2. Section A consists of 20 questions of 1 mark each. Attempt any 16 questions.
3. Section B consists of 20 questions of 1 mark each. Attempt any 16 questions.
4. Section C consists of 10 questions based on two Case Studies. Attempt any 8 questions.
5. There is no negative marking.

Section A
Attempt any 16 questions

1. After simplification, $\frac{13^{1/5}}{13^{1/3}}$ is **[1]**

   a) $13^{8/15}$ b) $13^{2/15}$

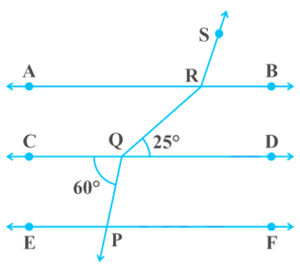
   c) $13^{-2/15}$ d) $13^{1/3}$

2. The cost of 2 kg of apples and 1 kg of grapes on a day was found to be ₹160. A linear equation in two variables to represent the above data is **[1]**

   a) x - 2y = 160 b) 2x + y = 160

   c) x + y = 160 d) 2x - y = 160

3. In a given figure, if AB || CD || EF, PQ || RS, ∠RQD = 25° and ∠CQP = 60°, then ∠QRS is equal to **[1]**



   a) 85° b) 110°

   c) 135° d) 145°

4. The base of an isosceles triangle is 8 cm long and each of its equal sides measures 6 cm. The area of the triangle is **[1]**

   a) $8\sqrt{5}\text{cm}^2$ b) $8\sqrt{3}\text{cm}^2$

   c) $16\sqrt{3}\text{cm}^2$ d) $16\sqrt{5}\text{cm}^2$

5. If $(16)^{2x+3} = (64)^{x+3}$, then 4^{2x-2} = **[1]**

a) 64 b) 256

c) 512 d) 32

6. The equation of a line parallel to x-axis and 3 units above the origin is **[1]**

a) x = 3 b) x = -3

c) y = 3 d) y = -3

7. Ordinate of a point is negative in **[1]**

a) quadrant IV only b) quadrant III only

c) quadrant I and II d) quadrant III and IV

8. It is given that $\triangle ABC \cong \triangle FDE$ and AB = 5 cm, $\angle B = 40°$ and $\angle A = 80°$. Then which of the following is true? **[1]**

a) DE = 5 cm, $\angle E = 60°$ b) DF = 5 cm, $\angle E = 60°$

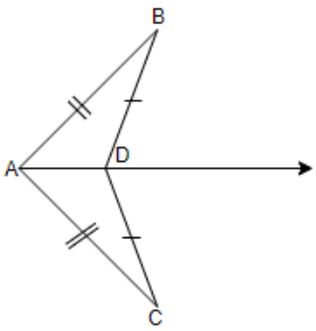
c) DF = 5 cm, $\angle F = 60°$ d) DE = 5 cm, $\angle D = 40°$

9. An irrational number between $\sqrt{2}$ and $\sqrt{3}$ is **[1]**

a) $(\sqrt{2} + \sqrt{3})$ b) $\sqrt{2} \times \sqrt{3}$

c) $5^{1/4}$ d) $6^{1/4}$

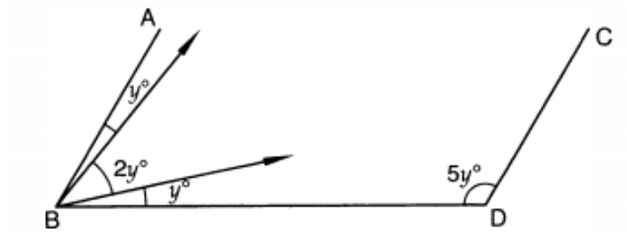
10. In fig., $\triangle ABD \cong \triangle ACD$, AB = AC, BD = DC name the criteria by which the triangles are congruent: **[1]**



a) ASA b) RHS

c) SSS d) SAS

11. In Fig., if line segment AB is parallel to the line segment CD, what is the value of y? **[1]**



a) 12 b) 18

c) 20 d) 15

12. The simplified form of $16^{\frac{-1}{4}} \times \sqrt[4]{16}$ is **[1]**

a) 16 b) 1

c) 4 d) 6

13. If $8^{x+1} = 64$, what is the value of 3^{2x+1}? **[1]**

a) 3 b) 27

c) 1 d) 9

14. A point whose abscissa is -3 and ordinate 2 lies in **[1]**

a) second quadrant b) fourth quadrant

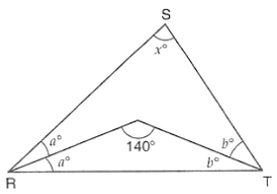
c) first quadrant d) third quadrant

15. The distance between the graph of the equations x = - 3 and x = 2 is **[1]**

a) 1 b) 3

c) 2 d) 5

16. In △RST (See Figure), what is the value of x? **[1]**



a) 100° b) 40°

c) 90° d) 80°

17. The sides of a triangle are x, y and z. If x + y = 7 m, y + z = 9 m, and z + x = 8 m, then area of the triangle is : **[1]**

a) $4\ m^2$ b) $7\ m^2$

c) $5\ m^2$ d) $6\ m^2$

18. The marks obtained by 17 students in a mathematics test (out of 100) are given below : **[1]**
91, 82, 100, 100, 96, 65, 82, 76, 79, 90, 46, 64, 72, 68, 66, 48, 49.
Find the range of the data.

a) 90 b) 46

c) 100 d) 54

19. The simplest form of $0.12\overline{3}$ is **[1]**

a) none of these b) $\frac{37}{330}$

c) $\frac{41}{330}$ d) $\frac{41}{333}$

20. The distance of the point P (4, 3) from the origin is **[1]**

a) 3 b) 5

c) 7 d) 4

Section B

Attempt any 16 questions

21. The graph of the line x = -2 passes through **[1]**

a) (3, -2) b) (-2, 3)

c) (0, 4)

d) (-1, 4)

22. The base of a right triangle is 8 cm and hypotenuse is 10 cm. Its area will be : **[1]**

a) $48\ cm^2$

b) $24\ cm^2$

c) $80\ cm^2$

d) $40\ cm^2$

23. The value of k if x = 3 and y = -2 is a solution of the equation 2x - 13y = k is **[1]**

a) 31

b) 23

c) 32

d) 30

24. The area of a triangle whose vertices are (0,0), (4,0) and (0,6) is: **[1]**

a) 6 sq. units

b) 36 sq. units

c) 12 sq.units

d) 24 sq. units

25. $\frac{125}{216}^{\frac{-1}{3}}$ = **[1]**

a) $\frac{6}{5}$

b) 125

c) $\frac{5}{6}$

d) 216

26. Area of an equilateral triangle of side 10 cm is : **[1]**

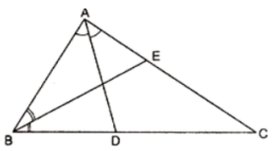
a) $50\sqrt{3}\ cm^2$

b) $100\sqrt{3}\ cm^2$

c) $10\sqrt{3}\ cm^2$

d) $25\sqrt{3}\ cm^2$

27. In figure, ABC is a triangle in which $\angle B = 2\angle C$. D is a point on side BC such that AD bisects $\angle BAC$ and AB = CD. BE is the bisector of $\angle B$. The measure of $\angle BAC$ is **[1]**



[**Hint:** $\Delta ABE \cong \Delta DCE$]

a) 74°

b) 73°

c) 72°

d) 95°

28. The rationalisation factor of $\frac{1}{2\sqrt{3}-\sqrt{5}}$ is **[1]**

a) $(\sqrt{3}+\sqrt{5})$

b) $\sqrt{12}+\sqrt{5}$

c) $\sqrt{5}-2\sqrt{3}$

d) $\sqrt{3}+2\sqrt{5}$

29. The ordinate of any point on x-axis is **[1]**

a) 0

b) any number

c) -1

d) 1

30. In a bar graph, 0.25 cm length of a bar represents 100 people. Then, the length of bar which represents 2000 people is **[1]**

a) 4.5 cm

b) 4 cm

c) 5 cm

d) 3.5 cm

31. The sides of a triangle are 5 cm, 12 cm and 13 cm. then its area is **[1]**

a) $0.003\ m^2$ b) $0.0015\ m^2$

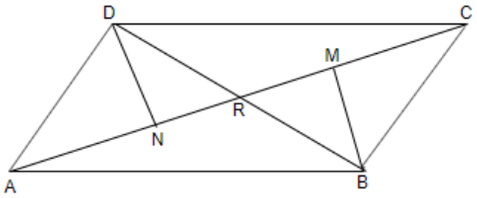
c) $0.0024\ m^2$ d) $0.0026\ m^2$

32. If $\sqrt{2} = 1.4142$, then $\sqrt{\frac{\sqrt{2}-1}{\sqrt{2}+1}}$ is equal to **[1]**

a) 0.1718 b) 5.8282

c) 0.4142 d) 2.4142

33. In quadrilateral ABCD, BM and DN are drawn perpendiculars to AC such that BM = DN. If BR = 8 cm. then BD is **[1]**



a) 12 cm b) 4 cm

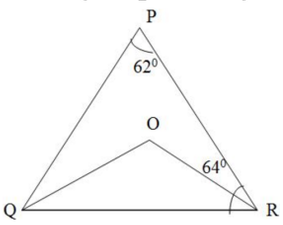
c) 16 cm d) 2 cm

34. The empirical relation between mean, mode and median is: **[1]**

a) Mode = 3 Mean - 2 Median b) Mode = 3 Median + 2 Mean

c) Mode = 3 Median - 2 Mean d) Mode = 2 Median - 3 Mean

35. In the adjoining figure ∠QPR = 62° and ∠PRQ = 64°. If OQ and OR and bisectors of ∠PQR and ∠ PRQ respectively, then ∠OQR and ∠QOR :- **[1]**



a) 121°, 20° b) 27°, 121°

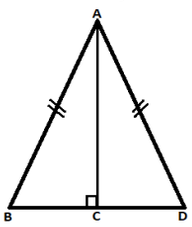
c) 20°, 80° d) 26°, 124°

36. x = 2, y = 5 is a solution of the linear equation **[1]**

a) 5 x + y = 7 b) x + y = 7

c) 5x +2y = 7 d) x + 2y = 7

37. In the adjoining figure, AB = AC and AD⊥BC. The rule by which $\triangle ABD \cong \triangle ACD$is **[1]**



a) RHS b) ASA

c) SAS d) SSS

38. If $x = 3 + \sqrt{8}$, then the value of $\left(x^2 + \frac{1}{x^2}\right)$ is **[1]**

a) 32 b) 34

c) 6 d) 12

39. The side BC of △ABC is produced to a point D. The bisector of ∠A meets side in L. If ∠ABC = 30° and ∠ACD = 115°, then ∠ALC = **[1]**

a) 85° b) None of these

c) 145° d) $72\frac{1}{2}^{\circ}$

40. To draw a histogram to represent the following frequency distribution : **[1]**

Class interval	5-10	10-15	15-25	25-45	45-75
Frequency	6	12	10	8	15

The adjusted frequency for the class 25-45 is

a) 6 b) 5

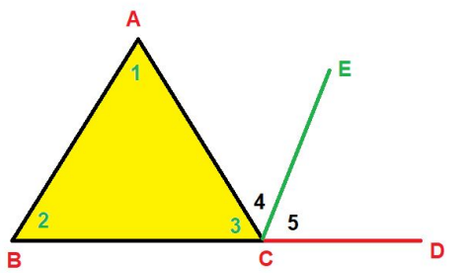
c) 2 d) 3

Section C

Attempt any 8 questions

Question No. 41 to 45 are based on the given text. Read the text carefully and answer the questions:

Once the Maths teacher of class IX D told students that today we will prove that the sum of all three angles is 180°. As shown in the figure, he told to draw any triangle ABC in the notebook.
Further side BC was extended to D.



Now the teacher said to draw CE||BA.
Further angles were named 1 to 5 as shown in the figure.

41. ∠2 is equal to which angle? **[1]**

a) ∠2 b) ∠4

c) ∠5 d) ∠3

42. BA || CE and AC is the transverse line, So ∠1 is equal to which angle? **[1]**

a) ∠2 b) ∠3

c) ∠5 d) ∠4

43. What is value of ∠3 + ∠4 + ∠5? **[1]**

a) 120° b) 360°

c) 180° d) 200°

44. What is value of $\angle ECD = \angle 4 + \angle 5$? **[1]**

a) $\angle 1 + \angle 2$ b) $\angle 3 + \angle 4$

c) $\angle 2 + \angle 3$ d) $\angle 3 + \angle 5$

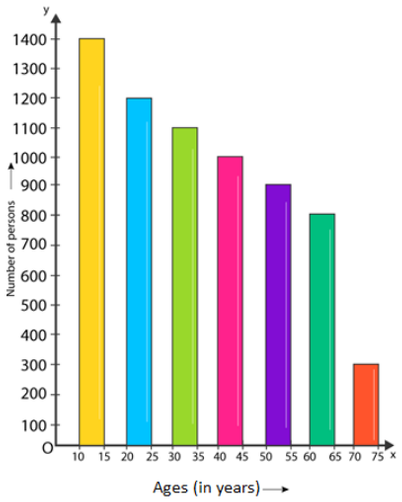
45. What is value of $\angle 1 + \angle 2 + \angle 3$? **[1]**

a) 360^o b) $\angle 3 + \angle 4 + \angle 5 = 180^o$

c) $280°$ d) $\angle 3 + \angle 4 = 100^o$

Question No. 46 to 50 are based on the given text. Read the text carefully and answer the questions:

A healthcare survey was done by the state health and family welfare care board of the state of Punjab. The data is collected by forming age groups; i.e; 10-15, 20-25 .... and so on. The overall data from a town is given below in the form of a bar graph. Read the data carefully and answer the questions that follow.



46. What is the percentage of the youngest age-group persons over those in the oldest age group? **[1]**

a) 466.67% b) 500%

c) 500.67% d) 400.56%

47. What is the total population of the town? **[1]**

a) 6700 b) 6800

c) 7000 d) 6600

48. How many persons are more in the age-group 10-15 than in the age group 30-35? **[1]**

a) 300 b) 200

c) 250 d) 100

49. What is the age-group of exactly 1200 persons living in the town? **[1]**

a) 20-25 b) 25-30

c) 10-15 d) 15-20

50. What is the total number of persons living in the town in the age-groups 10-15 and 60-65? **[1]**

a) 2000 b) 2100

c) 2400 d) 2200

Solution

Section A

1. **(c)** $13^{-2/15}$

   Explanation: $\frac{13^{1/5}}{13^{1/3}}$

   $= 13^{1/5+1/3}$

   $=13^{-2/15}$

2. **(b)** 2x + y = 160

   Explanation: Let the cost of apples be ₹x per Kg and cost of grapes be ₹y per Kg. The cost of 2 kg of apples and 1 kg of grapes on a day was found to be ₹160.

   So the equation will be

   2x + y = 160

3. **(d)** 145°

   Explanation: Given, PQ || RS

   ∠PQC = ∠BRS = 60° [alternate exterior angles and ∠PQC = 60° (given)] and ∠DQR = ∠QRA = 25° [alternate interior angles]

   [∠DQR = 25°, given]

   ∠QRS = ∠QRA + ∠ARS

   = ∠QRA + (180° – ∠BRS) [linear pair axiom]

   = 25° + 180° – 60°= 205° – 60°= 145°

4. **(a)** $8\sqrt{5}\text{cm}^2$

   Explanation: Area of isosceles triangle $= \frac{b}{4}\sqrt{4a^2 - b^2}$

   Here,

   a = 6 cm and b = 8 cm

   Thus, we have

   $\frac{8}{4} \times \sqrt{4(6)^2 - 8^2}$

   $= \frac{8}{4} \times \sqrt{144 - 64}$

   $= \frac{8}{4} \times \sqrt{80}$

   $= \frac{8}{4} \times 4\sqrt{5}$

   $= 8\sqrt{5}\text{cm}^2$

5. **(b)** 256

   Explanation: $(16)^{2x+3} = (64)^{x+3}$

   $\Rightarrow (2^4)^{2x+3} = (2^6)^{x+3}$

   $\Rightarrow 2^{8x+12} = 2^{6x+18}$

   Comparing, we get

   8x + 12 = 6x +18

   $\Rightarrow$ 8x - 6x = 18 - 12

   $\Rightarrow$ 2x = 6

   $\Rightarrow x = \frac{6}{2}$

   $\Rightarrow$ x=3

   Now $4^{2x-2} = 4^{2\times(3)-2} = 4^{6-2} = 4^4$

   $= 4 \times 4 \times 4 \times 4 = 256$

6. **(c)** y = 3

   Explanation: The equation of a line parallel to x-axis and 3 units above the origin is

   y = 3

   because when a line parallel to x axis in that case equation of line is y = a

where a is the co-ordinate of y-axis and 3 units above the origin value x -cordinate is 3 so required equation is y = 3

7. **(d)** quadrant III and IV
Explanation: Since, sign of point in 3rd quadrant is (-, -).
And in 4th quadrant, it is (+, -).
So, Ordinate of a point is -ve only in 3rd and 4th quadrant.

8. **(b)** DF = 5 cm, $\angle E = 60°$
Explanation: Given that: In $\triangle ABC$, AB = 5 cm, $\angle B = 40°$ and $\angle A = 80°$
Using angles sum property of triangle, we have
$\angle A + \angle B + \angle C = 180°$
$\Rightarrow 80° + 40° + \angle C = 180$
$\Rightarrow 120° + \angle C = 180°$ [$\because \angle B = 40°$ and $\angle A = 80°$]
$\Rightarrow \angle C = 180° - 120°$
$\Rightarrow \angle C = 60°$
It is given that $\triangle ABC \cong \triangle FDE$, so we have
AB = FD, BC = DE and AC = FE & $\angle A = \angle F$, $\angle B = \angle D$ and $\angle C = \angle E$
$\Rightarrow$ AB = FD = 5cm and $\angle C = \angle E = 60°$.

9. **(d)** $6^{1/4}$
Explanation: $\sqrt{2}$ and $\sqrt{3}$
= $2^{\frac{1}{2}}$ and $3^{\frac{1}{2}}$
= $2^{\frac{2}{4}}$ and $3^{\frac{2}{4}}$
= $4^{\frac{1}{4}}$ and $9^{\frac{1}{4}}$
irrational between $\sqrt{2}$ and $\sqrt{3}$ is $6^{1/4}$

10. **(c)** SSS
Explanation: Given that two sides are equal and third side is common I.e AD hence all three corresponding sides are equal

11. **(c)** 20
Explanation: Since, AB ∥ CD
And, BD cuts them
$y + 2y + y + 5y = 180^o$ (Consecutive interior angle)
$9y = 180^o$
$y = 20^o$

12. **(b)** 1
Explanation:
$16^{\frac{-1}{4}} \times \sqrt[4]{16}$
$But,\ 16 = 2^4$
$so,$
$\Rightarrow 16^{\frac{-1}{4}} \times \sqrt[4]{16}$
$\Rightarrow \{(2)^4\}^{\frac{-1}{4}} \times (2)^{4 \times \frac{1}{4}}$
$\Rightarrow (2)^{4 \times \frac{-1}{4}} \times 2$
$\Rightarrow 2^{-1} \times 2$
$\Rightarrow \frac{2}{2}$
$\Rightarrow 1$

13. **(b)** 27
Explanation: Given $8^{x+1} = 64$
$8^{x+1} = 64$

$8^{x+1} = 8^2$

$\Rightarrow x+1=2$

$\Rightarrow x=2-1$

$\Rightarrow x=1$

Now $3^{2x+1} = 3^{2(1)+1}$

$= 3^{2+1}$

$= 3^3$

$= 27$

14. **(a)** second quadrant
Explanation: As we know that abscissa is negative in second and third coordinate and ordinate is positive in first and second coordinate. Therefore the given point (-3, 2) lies in second coordinate.

15. **(d)** 5
Explanation: Distance between the graph of the equations x = -3 and x = 2 is = 2 – (-3) = 5 units

16. **(a)** 100°
Explanation: In $\triangle$RST

$\angle R + \angle S + \angle T = 180°$

$\Rightarrow 2a^\circ + x^\circ + 2b^\circ = 180°$

$\Rightarrow x^\circ = 180° - 2(a+b)°$ ...(i)

Now, in $\triangle$ROT

$\angle ORT + \angle ROT + \angle OTR = 180°$

$\Rightarrow a° + 140° + b° = 180°$

$\Rightarrow (a+b)° = 180° - 140° = 40°$ ...(ii)

From eq (i) and (ii)

$x^0 = 180^\circ - 2(40^\circ)$

$\Rightarrow x = 100^\circ$

17. **(d)** 6 m^2
Explanation: Adding given three equaitons,

$2x + 2y + 2z = 24 \Rightarrow x + y + z = 12$

Therefore, s = $\frac{12}{2}$ = 6 m

Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{6(6-x)(6-y)(6-z)}$

$= \sqrt{6(12-6-x)(12-6-y)(12-6-z)}$

$= \sqrt{6(y+z-6)(x+z-6)(x+y-6)}$

$= \sqrt{6(9-6)(8-6)(7-6)}$

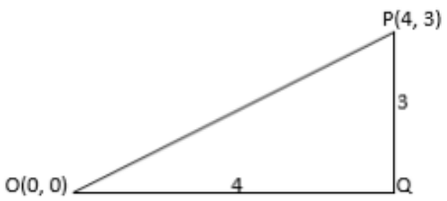
$= \sqrt{6 \times 3 \times 2 \times 1}$

= 6 sq. m

18. **(d)** 54
Explanation: Highest Marks = 100
Lowest Marks = 46
Range of data = 100 - 46 = 54

19. **(a)** none of these
Explanation: none of these
Since $0.12\overline{3} = \frac{111}{900} = \frac{37}{300}$

20. **(b)** 5
Explanation:



Using Pythagorous theorem: $OP^2 = OQ^2 + QP^2$

$OP^2 = 4^2 + 3^2$

$OP^2 = \sqrt{16+9} = 5$

Section B

21. **(b)** (-2, 3)

Explanation: Because value of x -co-ordinate is - 2

22. **(b)** 24 cm^2

Explanation: Perpendicular = $\sqrt{10^2 - 8^2} = \sqrt{100 - 64}$ = 6 cm

Area of triangle = $\frac{1}{2} \times$ Base $\times$ Height

= $\frac{1}{2} \times 8 \times 6$ = 24 sq. cm

23. **(c)** 32

Explanation: We have to find the value of 'k' if x = 3 and y = -2 is a solution of the equation 2x – 13y = k

2x - 13y = k

2(3) - 13(-2) = k

6 + 26 = k

k = 32

24. **(c)** 12 sq.units

Explanation: We have a point (0,0) i.e; origin.

A point (4,0) whose y-coordinate is zero.

So, this point is having 4 units in x-axis = base (let)

A point (0,6) i.e. 6 units in y-axis = height of a triangle

So, these point forms a right angle triangle

so, Area of a triangle = ½ × Base × Height

Area of a triangle = ½ × 6 × 4 = 12 sq. units

25. **(a)** $\frac{6}{5}$

Explanation: $\frac{125}{216}^{\frac{-1}{3}}$

= $\frac{5}{6}^{3 \times \frac{-1}{3}}$

= $\frac{5}{6}^{-1}$

= $\frac{6}{5}$

26. **(d)** $25\sqrt{3}$ cm^2

Explanation: Area of equilateral triangle = $\frac{\sqrt{3}}{4}(\text{Side})^2$

= $\frac{\sqrt{3}}{4}(10)^2$

= $25\sqrt{3}$ sq. cm

27. **(c)** 72°

Explanation: Given that $\triangle$ABC

BE is bisector of ∠Band AD is bisector of ∠BAC

∠B = 2∠C

By exterior angle theorem in triangle ADC

∠ADB = ∠DAC + ∠C ...(i)

In $\triangle$ADB,

∠ABD + ∠BAD + ∠ADB = 180°

2∠C + ∠BAD + ∠DAC + ∠C = 180° [From (i)]

3∠C + ∠BAC = 180°

∠BAC = 180° - 3∠C ...(ii)

Therefore,

AB = CD

∠C = ∠DAC

∠C = 1/2 ∠BAC ....(iii)
Putting value of Angle C in (ii), we get
∠BAC = 180° - 1/2 ∠BAC
$\angle \mathrm{BAC} + \frac{3}{2}\angle \mathrm{BAC} = 180^{\circ}$
$\frac{5}{2}\angle BAC = 180^{\circ}$
$\angle \mathrm{BAC} = \frac{180 \times 2}{5}$
= 72°
∠BAC = 72°

28. **(b)** $\sqrt{12} + \sqrt{5}$
Explanation: $\frac{1}{2\sqrt{3}-\sqrt{5}}$
$= (2\sqrt{3} - \sqrt{5})(2\sqrt{3} + \sqrt{5})$
=12-5
= 7
Rational number
$(2\sqrt{3} + \sqrt{5}) = (\sqrt{4 \times 3} + \sqrt{5}) = \sqrt{12} + \sqrt{5}$

29. **(a)** 0
Explanation: The ordinate of any point on x-axis is always zero. This means that this point hasn't covered any distance on y-axis.

30. **(c)** 5 cm
Explanation: Use unitary method
0.25 cm - 100 people
So 1 cm - 400 people
So for 2000 people:
$\frac{2000}{400}$ = 5 cm

31. **(a)** 0.003 m^2
Explanation: s = $\frac{5+12+13}{2}$ = 15 cm
Area of triangle = $\sqrt{s\,(s-a)\,(s-b)\,(s-c)}$
$= \sqrt{15\,(15-5)\,(15-12)\,(15-13)}$
$= \sqrt{15 \times 10 \times 3 \times 2}$
= 30 sq. cm
= 0.003 sq. m

32. **(c)** 0.4142
Explanation: Given $\sqrt{2}$ =1.4142
$\sqrt{\frac{\sqrt{2}-1}{\sqrt{2}+1}}$
$= \sqrt{\frac{\sqrt{2}-1}{\sqrt{2}+1} \times \frac{\sqrt{2}-1}{\sqrt{2}-1}}$
$= \sqrt{\frac{(\sqrt{2}-1)^2}{(\sqrt{2})^2-(1)^2}}$
$= \sqrt{\frac{(\sqrt{2}-1)^2}{2-1}}$
$= (\sqrt{2} - 1)$
=1.4142-1
= 0.4142

33. **(c)** 16 cm
Explanation: In triangles $\triangle DNR$ and $\triangle BMR$,
∠N = ∠M = 90^o
∠NRD = ∠MRB (vertically opposite angles)
BM = DN(Given)

Therefore, $\triangle DNR$ and $\triangle MRB$ are congruent
Therefore, BR = DR = 8 cm
BD = 16 cm

34. **(c)** Mode = 3 Median - 2 Mean
Explanation: For frequency distribution: mean, mode & median connected by the relation
mean - mode = 3(mean - median)
Thus,
mode = 3 median - 2 mean

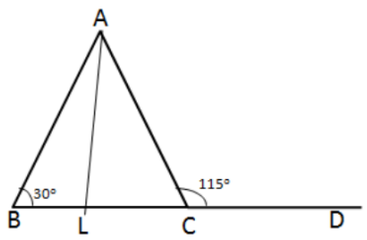
35. **(b)** 27°, 121°
Explanation: In △PQR
∠QPR + ∠PQR + ∠PRQ = 180° (Angle sum property)
∠PQR = 180° - 62° - 64°
∠PQR = 54°
∠ORQ = 32° (OR is a bisector)
∠OQR = 27° (OQ is a bisector)
In △OQR
∠OQR + ∠ORQ + ∠QOR = 180° (Angle sum property)
∠QOR = 180° - 32° - 27° = 121°

36. **(b)** x + y = 7
Explanation: x = 2 and y = 5 satisfy the given equation.

37. **(a)** RHS
Explanation: In △ABD and △ADC, we have,
∠ADB = ∠ADC (Right angles)
AB = AC (Given and hyptenuses)
AD = AD (common in both)
Therefore,$\triangle ABD \cong \triangle ACD$ by RHS.

38. **(b)** 34
Explanation:
$$given: x = (3+\sqrt{8})$$
$$\frac{1}{x} = \frac{1}{(3+\sqrt{8})} = \frac{1}{(3+\sqrt{8})} \times \frac{(3-\sqrt{8})}{(3-\sqrt{8})}$$
$$= \frac{(3-\sqrt{8})}{(3^2-(\sqrt{8})^2)} = \frac{(3+\sqrt{8})}{(9-8)} = (3-\sqrt{8})$$
$$\left(x+\frac{1}{x}\right) = (3+\sqrt{8})+(3-\sqrt{8}) = 6$$
$$\Rightarrow \left(x+\frac{1}{x}\right)^2 = 6^2 = 36$$
$$\Rightarrow \left(x^2+\frac{1}{x^2}\right)+2\times x\times\frac{1}{x} = 36$$
$$\Rightarrow \left(x^2+\frac{1}{x^2}\right)+2 = 36$$
$$\Rightarrow \left(x^2+\frac{1}{x^2}\right) = 36-2 = 34$$

39. **(d)** $72\frac{1}{2}^\circ$
Explanation:



∠C = 180° - ∠ACD = 180° - 115° = 65°
In △ABC
∠A + ∠B + ∠C = 180°

$\Rightarrow \angle A = 180 - 30° - 65°$

$\Rightarrow \angle A = 85°$

Now in $\triangle ALC$

$\angle ALC + \angle LAC + \angle C = 180°$

$\Rightarrow \angle ALC = 180° - \angle LAC - \angle C$

$= 180^\circ - \frac{\angle A}{2} - \angle C$

$= 180^\circ - \frac{85^\circ}{2} - 65^\circ$

$= \frac{145^\circ}{2}$

$= 72\frac{1}{2}^\circ$

40. **(c)** 2

Explanation: Adjusted frequency = $\left(\frac{\text{frequency of the class}}{\text{width of the class}}\right) \times 5$

Therefore, Adjusted frequency of 25 - 45 = $\frac{8}{20} \times 5 = 2$

Section C

41. **(c)** $\angle 5$

Explanation: $\angle 5$

42. **(c)** $\angle 5$

Explanation: $\angle 5$

43. **(c)** 180°

Explanation: 180°

44. **(a)** $\angle 1 + \angle 2$

Explanation: $\angle 1 + \angle 2$

45. **(b)** $\angle 3 + \angle 4 + \angle 5 = 180^o$

Explanation: $\angle 3 + \angle 4 + \angle 5 = 180^o$

46. **(a)** 466.67%

Explanation: 466.67%

47. **(a)** 6700

Explanation: 6700

48. **(a)** 300

Explanation: 300

49. **(a)** 20-25

Explanation: 20-25

50. **(d)** 2200

Explanation: 2200