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Class: 9
Subject: Mathematics
Topic: ASK1509UT03
No. of Questions: 30

Q1. Which of the following equation is not linear equation?

(a) $2x + 3 = 7x - 2$
(b) $\frac{2}{3}x + 5 = 3x - 4$
(c) $x^2 + 3 = 5x - 3$
(d) $(x - 2)^2 = x^2 + 8$

Sol. (c)

Q2. The value of x which satisfy $\frac{6x+5}{4x+7} = \frac{3x+5}{2x+6}$ is

(a) -1
(b) 1
(c) 2
(d) -2

Sol. (b)

Check using options

Q3. A man is thrice as old as his son. After 14 years, the man will be twice as old as his son, then present age of his son.

(a) 42 years
(b) 14 years
(c) 12 years
(d) 36 years

Sol. (b)

Let the present age of son be x

Then, age of his father = 3x

According to the given condition

3x+14 = 2(x+ 14)

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$\Rightarrow x = 14\ years$

Q4. The graph of line 5x + 3y = 4 cuts Y- axis at the point

(a) $\left(0,\frac{4}{3}\right)$
(b) $\left(0,\frac{3}{4}\right)$
(c) $\left(\frac{4}{5},0\right)$
(d) $\left(\frac{5}{4},0\right)$

Sol. (a)

Put x = 0 in the equation,

$y = \frac{4}{3}$

Q5. If p = 3x + 1, q = $\frac{1}{3}$ $(9x + 13)$ and p : q = 6 : 5 then find x.

(a) 5
(b) -7
(c) 7
(d) 3

Sol. (b)

$$\frac{p}{q} = \frac{3(3x+1)}{9x+13} = \frac{6}{5}$$

$45x + 15 = 54x + 78$

$9x = -63$

$x = -7$

Q6. The angles of a quadrilateral are in the ratio 3 : 5 : 9 : 13 . Find the biggest angle of the quadrilateral

(a) 36°
(b) 158°
(c) 60°

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(d) 156°

Sol. (d)

Given the ratio between the angles of the quadrilateral = 3 : 5: 9 : 13 and 3 +5 +9 +13 = 30

Since, the sum of the angles of the quadrilateral = 360°

∴ First angles of it = $\frac{3}{30} \times 360° = 36°$

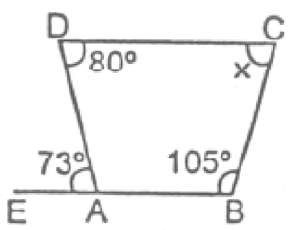
Second angle = $\frac{5}{30} \times 360° = 60°$

Third angle = $\frac{9}{30} \times 360° = 108°$

And, Fourth angle = $\frac{13}{30} \times 360° = 156°$

∴ The angles of quadrilateral are 360°, 60°, 108° and 156°

Q7. Use the information given in adjoining figure to calculate the value of x.



(a) 73°
(b) 68°
(c) 107°
(d) 120°

Sol. (b)

Since, EAB is a straight line.

∴ ∠DAE + ∠DAB = 180°

⇒ 73° + ∠DAB = 180°

i.e., ∠DAB = 180° - 73° = 107°

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Since, the sum of the angles of quadrilateral ABCD is 360°

∴ 107° + 105° x + 80° = 360°

⇒ 292° + x = 360°

$\Rightarrow x = 360° - 292°$

$\Rightarrow x = 68°$

Q8. In a parallelogram ABCD, ∠D = 105°, then the ∠A and ∠B will be.

(a) 105° , 75
(b) 75° , 105°
(c) 105° 105°
(d) 75°, 75°

Sol. (b)

∵ ∠A +∠D = 180°

∴ ∠A = 180° -∠D = 180° - 105°

= 75°

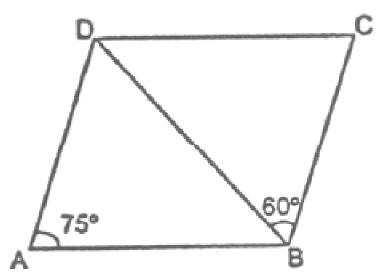
Similarly ∠A+ ∠B = 180°

∴ ∠B = 180° -∠A

= 180° -75°

= 105°

Q9. In the following figure, ABCD is a parallelogram in which ∠DAB = 75° and ∠DBC = 60° . Find ∠CDB



(a) 75°
(b) 60°
(c) 120°
(d) 45°

Sol. (d)

∠A + ∠ABD + ∠DBC = 180°

∴ ∠ABD = 180° - ∠A - ∠DBC

= 180° - 75° -60°

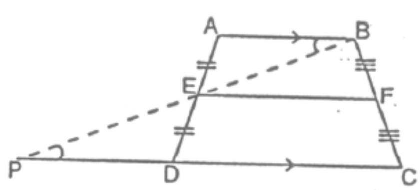
∠ABD = 45°

Now,

∠CDB = ∠ABD

∴ ∠CDB = 45° (Alternative interior angle)

Q10. In the given figure, E and F are respectively, the mid-points of non-parallel sides of a trapezium ABCD then



(a) $EF \parallel AB \;\&\; EF = AB + DC$
(b) $EF \nparallel AB \;\&\; EF = AB + DC$
(c) $EF \parallel$ AB & EF = $\frac{1}{2}(AB + DC)$
(d) $EF \nparallel AB \;\&\; EF = \frac{1}{2}(AB + DC)$

Sol. (c)

Join BE and Produce it to intersect CD produced at point P. In ΔDEP, AB ∥ PC and BP is transversal

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$\Rightarrow \quad \angle ABE = \angle DPE$ [Alternate interior angles]

∠AEB = ∠DEP [Vertically opposite angles]

And AE = DE [E is mid- point of AD]

$\Rightarrow \quad \Delta AEB \cong \Delta DEP$ [By ASA]

⇒ BE = PE [By CPCT]

And AB = DP [CPCT]

Since, the line joining the mid-points of any two sides of a triangle is parallel and half of the third side, therefore, is ΔBPC,

E is mid – point of BP [As, BE = PE]

And F is mid – point of BC [Given]

$\Rightarrow \quad EF \parallel PC \text{ and } EF = \frac{1}{2} PC$

$\Rightarrow \quad EF \parallel DC \text{ and } EF = \frac{1}{2}(PD + DC)$

$\Rightarrow \quad EF \parallel AB \text{ and } EF = \frac{1}{2}(AB + DC)$ [As, DC ∥ AB and PD = AB]

Q11. When the diagonal of a parallelogram are equal but not perpendicular to each other it is called a.

(a) Square
(b) Rectangle
(c) Rhombus
(d) Parallelogram

Sol. (b)

Q12. In a parallelogram the sum of the angle bisectors of two adjacent angle is :

(a) 30°
(b) 45°
(c) 60°
(d) 90°

Sol. (d)

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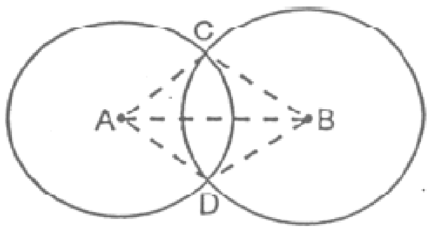
Q13. Two circles with centers A and B interest at C and D. then



(a) $\angle ACB = \frac{2}{3}\angle ADB$
(b) $\angle ACB = \angle ADB$
(c) $\angle ACB = 2\angle ADB$
(d) None of the above

Sol. (b)

Given: Two circles with centers A and B intersect at C and D.

To Prove: ∠ACB = ∠ADB

Construction: Join AC, AD, BC, BD and AB.

Proof: In ΔACB and ΔADB,

AC = AD[Radii of the same circle]

BC = BD[Radii of the same circle]

AB = AB [Common]

∴ $\Delta\, ACB \cong \Delta\, ADB$ [By SSS]

∴ $\angle ACB = \angle ADB$ [By CPCT]

Q14. If two circular wheels rotate on a horizontal road then locus of their centers will be

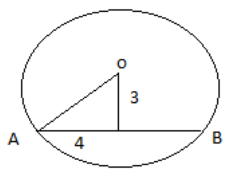
(a) Circles
(b) Rectangle
(c) Two straight line
(d) Parallelogram

Sol. (c)

Q15. If a chord a length 8 cm is situated at a distance of 3cm from centre, then the diameter of circle is:

(a) 11 cm
(b) 10 cm
(c) 12 cm
(d) 15 cm

Sol. (b)



$AO^2 = OC^2 + (AC)^2$

$AO = \sqrt{3^2 + 4^2} = 5$

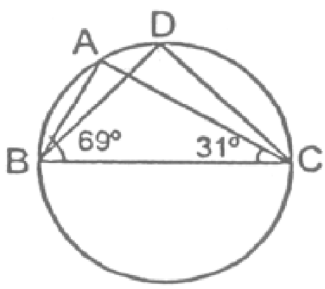
∴ Diameter = 2 ×AO = 10 cm

Q16. In a circle the length of chords which are situated at a equal distance from centre are :

(a) Double
(b) Four times
(c) Equal
(d) Three times

Sol. (c)

Q17. In figure, ∠ABC = 69° , ∠ACB = 31°, find ∠BDC.



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(a) 80°
(b) 100°
(c) 69°
(d) 31°

Sol. (a)

In ΔABC

$\angle BAC + \angle ABC + \angle ACB = 180°$ [Sum of all the angles of a triangle is 180°]

$\Rightarrow \quad \angle BAC + 69° + 31° = 180°$

$\Rightarrow \quad \angle BAC + 100° = 180°$

$\Rightarrow \quad \angle BAC = 180° - 100° = 80°$

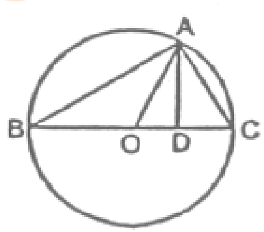
Now, ∠BDC = ∠BAC = 80° [Angles in the same segment of a circle are equal]

Q18. Find the area of a triangle, the radius of whose circumcircle is 3 cm and the length of the altitude drawn from the opposite vertex to the hypotenuse is 2 cm

(a) 3
(b) 2
(c) 6
(d) 12

Sol. (c)

We know that the hypotenuse of a right angled triangle is the diameter of its circumcircle.



∴ BC = 2 OB = 2 ×3 = 6 cm

Let, AD $\perp$ BC

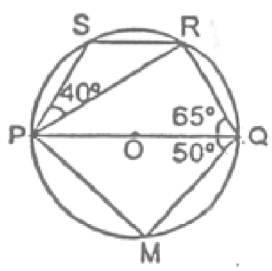
AD = 2 cm [Given]

∴ Area of ΔABC = $\frac{1}{2}(BC)(AD)$

$= \frac{1}{2}(6)(2)$

= 6 cm^2

Q19. In figure, PQ is a diameter of a circle with centre O. IF ∠PQR = 65°, ∠SPR = 40°, ∠PQM = 50°, find ∠QPR,



(a) 60°
(b) 30°
(c) 25°
(d) 40°

Sol. (C)

∠QPR

∴ PQ is a diameter

∴ ∠PRQ = 90° [Angle in a semi-circle is 90°]

In ΔPQR,

∠QPR + ∠PRQ + ∠PQR = 180° [Angle Sum Property of a triangle]

⇒ $\angle QPR + 90° + 65° = 180°$

⇒ $\angle QPR + 155° = 180°$

⇒ $\angle QPR = 180° - 155°$

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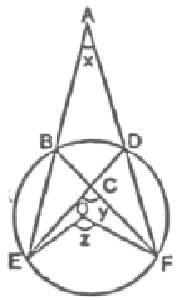
$\Rightarrow \quad \angle QPR = 25°$

Q20. In figure, O is the centre of the circle. Which of the following is correct?



(a) $\angle x + \angle y = \angle z$
(b) $2\angle x + \angle y = \angle z$
(c) $2\angle x + \frac{\angle y}{2} = \angle z$
(d) $3\angle x + \angle y = \angle z$

Sol. (a)

$\angle EBF = \frac{1}{2}\angle EOF = \frac{1}{2}\angle z$ [∵ Angle subtended by an arc of a circle at the centre in twice the angle subtended by it at any point of the remaining part of the circle]

∴ $\angle ABF = 180° - \frac{1}{2}\angle z$ ....(i) [Linear Pair Axiom]

$\angle EDF = \frac{1}{2}\angle EOF = \frac{1}{2}\angle z$

[∵ Angle subtend by any arc of a circle at the centre is twice the angle subtended by it at any point of the remaining part of the circle]

∴ $\angle ADE = 180° - \frac{1}{2}\angle z$ ...(ii) [Linear Pair Axiom]

$\angle BCD = \angle ECF = \angle y$ [Vert. Opp. Angle]

$\angle BAD = \angle x$

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In quadrilateral ABCD

∠ABC +∠BCD + ∠CDA + ∠BAD = 2 ×180° [Angle Sum Property of a quadrilateral]

$\Rightarrow 180° - \frac{1}{2}\angle z + \angle y + 180° - \frac{1}{2}\angle z + \angle x = 2 \times 180°$

$\Rightarrow$ ∠x+∠y = ∠z

Q21. If a trapezium is cyclic then,

(a) Its parallel sides are equal
(b) Its non – parallel sides are equal
(c) Its diagonals are not equal
(d) None of these above

Sol. (b)

Q22. The positive solution of the equation ax + by + c = 0 always lie on the

(a) I^{st} quadrant
(b) 2^{nd} quadrant
(c) 3^{rd} quadrant
(d) 4^{th} quadrant

Sol. (a)

Q23. Passing through the point (-3, 5)

(a) One and only one line can be drawn
(b) Two and only two lines can be drawn
(c) Only a finite number of lines can be drawn
(d) Infinitely many lines can be drawn

Sol. (d)

Q24. If we multiply or divide both sides of a linear equation with a non-zero number, then the solution of the linear equation:

(a) Changes
(b) Remains the same
(c) Changes in case of multiplication only

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(d) Change in case of division only

Sol. (b)

Q25. The point of the form (a, a) always lies on:

(a) x-axis
(b) Y-axis
(c) On the line y = x
(d) On the line x + y = 0

Sol. (c)

Q26. Which one of the following options is true, and why?

y = 3x + 5 has

(a) A unique solution
(b) Only two solution
(c) Infinitely many solutions
(d) No solution

Sol. (c)

Y = 3x + 5 has infinitely many solution, because for every value of x, there is a corresponding value of y and vice-versa

Q27. If (3, -2) is a solution of the equation 3x – py -7 = 0, then the value of p is

(a) -1
(b) 1
(c) -13/3
(d) 2

Sol. (a)

Put the value of x as 3 and y as -2 in the given equation to find the value of p.

Q28. ABCD is quadrilateral. If AC and BD are its diagonals then the

(a) Sum of the squares of the sides of the quadrilateral is equal to the sum of the squares of its diagonals

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(b) Perimeter of the quadrilateral is equal to the sum of the diagonals
(c) Perimeter of the quadrilateral is less than the sum of the diagonals
(d) Perimeter of the quadrilateral is greater than the sum of the diagonals

Sol. (d)

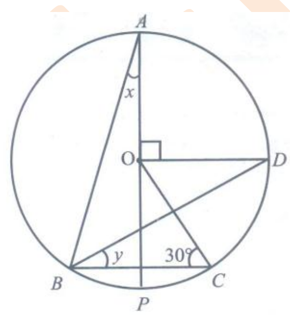
29. **Assertion :** if the angles of a quadrilateral are in the ratio 2 : 3 : 7 : 6, then the measures of angels are 40°, 60°, 140°, 120° respectively.

Reason: The sum of the angles of a quadrilateral is 360°

(a) If the **Assertion** and Reason are **correct**, but Reason is the **correct explanation** of Assertion.
(b) If both **Assertion** and **Reason** are correct, but Reason **is not the correct explanation** of Assertion.
(c) If **Assertion** is **correct** but **Reason** is **incorrect**.
(d) If **Assertion** is **incorrect** but **Reason** is **correct.**

Sol. (a)

Q30. In figure, O is the centre of the circle, ∠BCO = 30°, Find x



(a) 30°
(b) 60°
(c) 90°
(d) 45°

Sol. (a)

In ΔOCP,

∠OPC = 90°

∴ AP ⊥ BC

∠OCP = 30°

∴ ∠PCO = 90° - 30° = 60°

DO ⊥ AP,

∴ ∠DOP = 90°

∴ ∠COD = 90° -60° = 30°

∠CBD = $\frac{1}{2}\angle COD$ [Angle subtended theorem]

∴ $y = \frac{1}{2} \times 30° = 15°$

$y = 15° \ \angle AOD = 90°$

∴ $\angle ABD = \frac{1}{2} \angle AOD$ [Angle subtended theorem]

∠ABD = $\frac{1}{2} \times 90° = 45°$

In ΔABP,

$x + 45° + y + 90° = 180°$

$x + 45° + 15° + 90° = 180°$

$x = 180° - 150° = 30°$