Maths

9-CBSE-CT-5M

Solution

Section: A

1) $\frac{1}{\sqrt{18}-\sqrt{32}} = \frac{1}{3\sqrt{2}-4\sqrt{2}} = \frac{1}{-\sqrt{2}} = \frac{-1}{\sqrt{2}}$.

2) $p(-5) = 0$

$\therefore 0 = (-5)^3 + (-5)^2 + (-5)a + 115$

$\therefore 0 = -125 + 25 - 5a + 115$

$\therefore 5a = 15$

$\therefore \boxed{a = 3}$

3) In ΔABD, $AD = AB$

$\therefore \angle ADB = \angle ABD = \frac{1}{2}(180^\circ - \angle A)$

$= \frac{110^\circ}{2}$

$\therefore \angle ABD = 55^\circ$.

$\because$ | Alternate Int. angles

$\rightarrow \angle ABD = \angle CDB$

$\therefore \boxed{\angle CDB = 55^\circ}$

4) $\angle BOC = 2\angle BAC$ $\because$ | Angle made my arc at centre is the double the angle subtended at its alternate segment.

$\angle BOC = 80^\circ$

$\rightarrow$ In ΔBOC,

$\angle OBC + \angle OCB + \angle BOC = 180^\circ$. $\because$ | $\angle OBC = \angle OCB$.

$2\angle OBC = 180^\circ - \angle BOC$

$\therefore 2\angle OBC = 180^\circ - 80^\circ$

$\therefore \boxed{\angle OBC = 50^\circ}$

Section: B

5) In Δ ACB, $\angle ACB = 90°$. $\because$ Angle in a semi-circle

$\angle ABC = 180° - ADC$ $\because$ opposite angles in a quadrilateral

$= 180° - 130°$

$\angle ABC = 50°$

$\rightarrow$ $\angle BAC = 180° - \angle ABC - \angle ACB$

$= 180° - 50° - 90°$

$\therefore \boxed{\angle BAC = 40°}$

6) In right Δ OCA, $OA^2 = AC^2 + OC^2$

$\therefore OC^2 = 25 - 16 = 9$

$\therefore OC = 3cm$

$\rightarrow$ OD = OC + CD

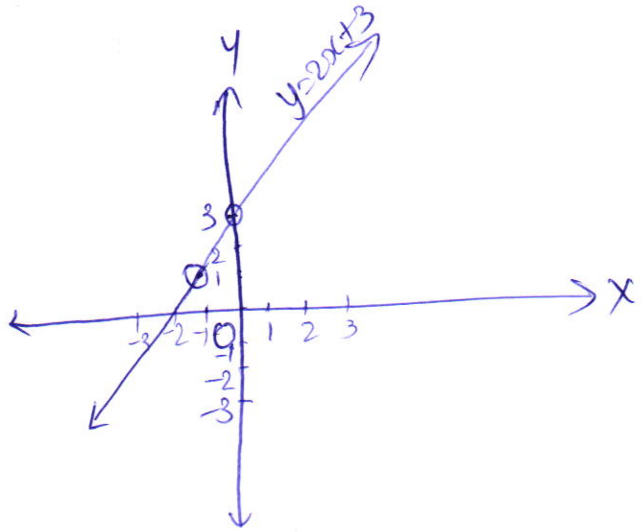
$\therefore$ CD = OD − OC $\because$ OD = r = 5

= 5 − 3

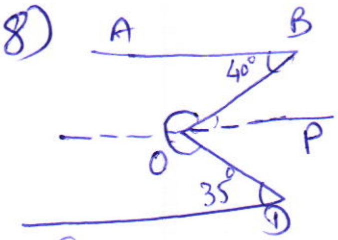
$\therefore \boxed{CD = 2cm}$

7) $y = 2x + 3$

x	0	−1
$y=2x+3$	3	1



8)



$\rightarrow$ $\angle BOP = \angle ABO$ $\because$ Alt. Int. angles

$= 40°$

$\rightarrow$ $\angle CDO = \angle POD$ $\because$ Alt. Int. angles

$\therefore \angle POD = 35°$

$\rightarrow \therefore \angle BOD = 40° + 35° = 75°$.

$\rightarrow \angle x^\circ = 360^\circ - 75^\circ$

$\therefore \boxed{x^\circ = 285^\circ}$

9) ~~So~~ . $\angle 1 = \angle 2$

& $\angle 3 = \angle 4$

$\angle 1 + \angle 3 = \angle 2 + \angle 4$

$\therefore \angle BAD = \angle ABC$ —(i)

$\rightarrow$ In ΔABD & ΔABC

$AD = BC$ $\because$| given

$\angle BAD = \angle ABC$ $\because$| by (i)

$AB = AB$ $\because$| common side

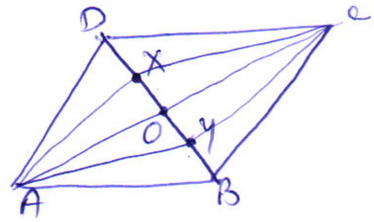
$\therefore$ By SAS criterion of congruence we have

$\Delta ABD \cong \Delta BC\cancel{A}$

$\therefore \boxed{BD = AC}$ $\because$| CPCT

10) Since, the diagonals of the parallelogram bisects each other.

$\therefore OA = OC$ & $OB = OD$. —(i)



$\rightarrow DX = BY$.

$\therefore OB - BY = OD - DX$ $\because$| $OB = OD$ by (i)

$\therefore OX = \cancel{O}Y$

& $OA = OC$ $\because$| by (i)

$\therefore$ Diagonals of quadrilateral AXCY bisect each other ~~CE~~.

$\therefore$ $\square$AXCY is a parallelogram.

Section : C

11) ΔACD & ΔBCD are on same base BC between the same parallels AB & DC.

$\therefore ar(\Delta ABD) = ar(\Delta BCD)$

$\Rightarrow ar(\Delta ACD) - ar(\Delta COD) = ar(\Delta BCD) - ar(\Delta COD)$

$\Rightarrow ar(\Delta AOD) = ar(\Delta BOC)$.

12) Construction: Draw $EGF \parallel AB$ & $GOH \parallel AD$.

Proof: Since, $GH \parallel AD$ & $EF \parallel DC$,

$\therefore OG \parallel DE$ & $OE \parallel GD$.

$\Rightarrow$ EOGD is a parallelogram.

→ similarly, EAHO, HBFO & FOGC are parallelograms.

→ Now, OD is a diagonal of $\square$ EOGD.

$\therefore ar(\Delta EOD) = ar(\Delta DOG)$ — (i)

→ OA is a diagonal of $\square$ EAHO

$\therefore ar(\Delta EOA) = ar(\Delta AOH)$ — (ii)

→ OB is a diagonal of $\square$ HBFO

$\therefore ar(\Delta BOF) = ar(\Delta BOH)$ — (iii)

→ OC is a diagonal of $\square$ FOGC

$\therefore ar(\Delta FOC) = ar(\Delta COG)$ — (iv)

→ Adding (i), (ii), (iii) & (iv) we get,

$ar(EOD) + ar(EOA) + ar(BOF) + ar(FOC)$
$= ar(\Delta DOG) + ar(\Delta AOH) + ar(\Delta BOH) + ar(\Delta COG)$

$\therefore ar(\Delta AOD) + ar(\Delta BOC) = ar(\Delta AOB) + ar(\Delta COD)$.

13) $(a-b-c)(a^2+b^2+c^2+ab+ac-bc)$

$= a^3 + ab^2 + ac^2 + a^2b + a^2c - abc - a^2b - b^3 - bc^2 - ab^2 - abc + b^2c$
$- a^2c - b^2c - c^3 - abc - ac^2 + bc^2$

$= a^3 - b^3 - c^3 - 3abc$