9th - CBSE

18th Aug. '18

CT-2 M

Solution

Section: A

1) Substitute $x = -1$ in $x^{31} + 31$ we will get,

$= (-1)^{31} + 31$

$= -1 + 31$

$= 30$

2) $x^2 + \frac{1}{2}x + \frac{3}{2}x + \frac{1}{2}\left(\frac{3}{2}\right)$

$= x^2 + 2x + \frac{3}{4}$

3) Let the angle x is 20° more than its complement.

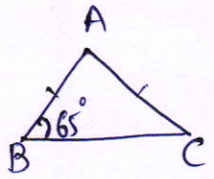
$\therefore$ Its complement $= x - 20^\circ$.

$x + x - 20^\circ = 90^\circ$

$2x = 110^\circ$

$\boxed{x = 55^\circ}$

4)



$AB = AC$

$\Rightarrow \angle B = \angle C$

$\Rightarrow \angle C = 65^\circ$.

$\angle A + \angle B + \angle C = 180^\circ$

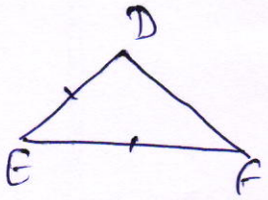
$\therefore \angle A = 180^\circ - 2(65^\circ)$

$\boxed{\angle A = 50^\circ}$

5) $p(x) = 5$ (or any constant)

Section 2B

6)



$DE = EF$

$\therefore \angle F = \angle D$ — (i)

$\because$ Angle sum prop.

$\angle D + \angle E + \angle F = 180^\circ$

$\because$ by (i)

$\angle D + 70^\circ + \angle D = 180^\circ$

$2\angle D = 180^\circ - 70^\circ$

$2\angle D = 110^\circ$

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

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

7) $x^4 - 125xy^3 = x(x^3 - 125y^3)$

$= x[(x)^3 - (5y)^3]$

$= x(x-5y)(x^2 + 5xy + 25y^2)$.

8) C is midpaint of $\bar{AB}$.

$\therefore AC = \frac{1}{2} AB$. — (i)

→ Also, D is midpaint of $\bar{AC}$.

$\therefore AD = \frac{1}{2} AC$ — (ii)

→ By using (i) & (ii) we have,

$AD = \frac{1}{2}\left(\frac{1}{2} AB\right)$

$\therefore \boxed{AD = \frac{1}{4} AB.}$

9) → AC || DE.

$\therefore \angle DEC = \angle ACB$ ∵ | corresponding angles

$\therefore \angle ACB = \boxed{y = 55^\circ}$

→ $\angle ACE = 180^\circ - \angle ACB$ ∵ | linear pair of angles

$= 180^\circ - 55^\circ$

$= 125^\circ$ —(i)

→ Also, AD || CE.

$\therefore \angle CAD + \angle ACE = 180^\circ$ ∵ | Consecutive angles

$\therefore \angle CAD = 180^\circ - 125^\circ$ ∵ | by (i)

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

→ $\angle BAC + \angle CAD + \angle X = 180^\circ$ ∵ | linear pair of angles

$\therefore \angle X = 180^\circ - 55^\circ - 70^\circ$

$= 180^\circ - 125^\circ$

$\therefore \boxed{X = 55^\circ}$

OR

9) $\angle ACH = \angle C = 80^\circ$ ∵ | vertically opp. angles

Also, $\angle C = \angle CEF = 80^\circ$

i.e. for two lines DF & AC and a transversal CE

& $\angle C = \angle CEF = 80^\circ$ ∵ | corresponding angles are equal

$\therefore$ DF || AC.