Date: 1^{st} Aug.'17

CT-1M

Std - 9^{th} CBSE

Solution :

Section : A

(1) Sum of $2\sqrt{5}$ & $3\sqrt{7}$ is : $2\sqrt{5}+3\sqrt{7}$.

(2) -4 is zero of the polynomial.

$\therefore P(-4) = 0$

$(-4)^2 + 11(-4) + k = 0$

$16 - 44 + k = 0$

$k = 44 - 16$

$\boxed{k = 28}$

(3) $\angle ACB + \angle C = 180^\circ$ ($\because$ linear pair of angles)

$\therefore \angle ACB = 180^\circ - \angle C$

$= 180^\circ - 100^\circ$

$\therefore \angle ACB = 80^\circ$

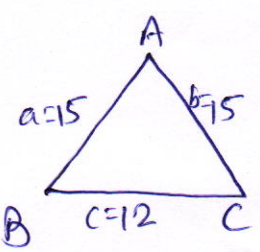
$\rightarrow \angle ABC + \angle ACB + \angle BAC = 180^\circ$ ($\because$ Angle sum prop. for triangles)

$\angle ABC + 80^\circ + 40^\circ = 180^\circ$

$\therefore \angle ABC = 180^\circ - 120^\circ$

$\therefore \boxed{\angle ABC = 60^\circ}$

(4)



$S = \frac{1}{2}(a+b+c) = \frac{1}{2}(15+15+12) = \frac{1}{2}(42) = 21$ cm

$S-a = 6$, $S-b = 6$, $S-c = 9$

$ar(\Delta ABC) = \sqrt{S(S-a)(S-b)(S-c)}$.

$= \sqrt{21 \times 6 \times 6 \times 9}$

$\boxed{ar(\Delta ABC) = 18\sqrt{21}\ cm^2}$

Section : B

(5) $3\sqrt[3]{8\times5} - 4\sqrt[3]{32\times10} - \sqrt[3]{5}$

$= 3\sqrt[3]{2^3\times5} - 4\sqrt[3]{4^3\times5} - \sqrt[3]{5}$

$= 3\times2\sqrt[3]{5} - 4\times4\sqrt[3]{5} - \sqrt[3]{5}$

$= 6\sqrt[3]{5} - 16\sqrt[3]{5} - \sqrt[3]{5}$

$= -11\sqrt[3]{5}$

(6) $p(y) = y^4 - 3y^2 + 7y - 10$

$= y^4 + 0y^3 - 3y^2 + 7y - 10$

To divide $p(y)$ by $y-2$

$$
\begin{array}{r|l}
 & y^3 + 2y^2 + y + 9 \\
\hline
y-2 & y^4 + 0y^3 - 3y^2 + 7y - 10 \\
 & \underline{\overset{-}{y^4} \overset{+}{-} 2y^3} \\
 & \quad 2y^3 - 3y^2 + 7y - 10 \\
 & \quad \underline{\overset{-}{2y^3} \overset{+}{-} 4y^2} \\
 & \qquad y^2 + 7y - 10 \\
 & \qquad \underline{\overset{-}{y^2} \overset{+}{-} 2y} \\
 & \qquad\quad 9y - 10 \\
 & \qquad\quad \underline{\overset{-}{9y} \overset{+}{-} 18} \\
 & \qquad\qquad 8
\end{array}
$$

$\therefore$ 8 is the remainder when $p(y)$ is divided by $(y-2)$.

(7) $\left[\left(x+\frac{1}{x}\right)\left(x-\frac{1}{x}\right)\right]\left(x^2+\frac{1}{x^2}\right)\left(x^4+\frac{1}{x^4}\right)$

$= \left[(x)^2-\left(\frac{1}{x}\right)^2\right]\left(x^2+\frac{1}{x^2}\right)\left(x^4+\frac{1}{x^4}\right)$ $\qquad \because (a-b)(a+b) = a^2-b^2$

$= \left[\left(x^2-\frac{1}{x^2}\right)\left(x^2+\frac{1}{x^2}\right)\right]\left(x^4+\frac{1}{x^4}\right)$

$= \left[(x^2)^2-\left(\frac{1}{x^2}\right)^2\right]\left(x^4+\frac{1}{x^4}\right)$

$= \left(x^4-\frac{1}{x^4}\right)\left(x^4+\frac{1}{x^4}\right)$

$= (x^4)^2-\left(\frac{1}{x^4}\right)^2$

$= x^8-\frac{1}{x^8}$

(8) $(x-2y)^3+(2y-z)^3+(z-x)^3$ is in the form of $a^3+b^3+c^3$ where, $a+b+c=0$

i.e. $x-2y+2y-z+z-x=0$

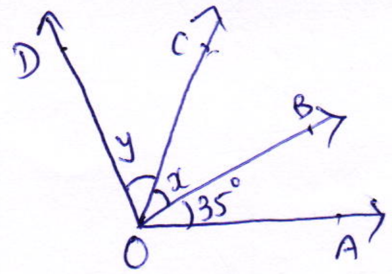
$\therefore (x-2y)^3+(2y-z)^3+(z-x)^3 = 3(x-2y)(2y-z)(z-x)$

$= 3(x-2y)(2yz-2xy-z^2+xz)$

$= \cancel{3x}\, 6\cancel{x}yz-6x^2y-3xz^2+3x^2z$
$-12y^2z+12xy^2+6yz^2-6x\cancel{y}z$

$= -6x^2y+3x^2z-3xz^2+12xy^2$
$-12y^2z+6yz^2$

(9)



$\angle DOB = 87^\circ$

let, $\angle COB = x$

& $\angle COD = y$

$\angle COA = 82^\circ$

$\therefore \angle AOB + \angle x = 82^\circ$

$\therefore \angle x = 82^\circ - \angle AOB$

$\therefore \angle COB = 82^\circ - 35^\circ$

$\therefore \boxed{\angle COB = 47^\circ}$

$\angle DOB = 87^\circ$

$\angle DOC + \angle COB = 87^\circ$

$\angle y + \angle x = 87^\circ$

$\angle y = 87^\circ - 47^\circ$

$\boxed{\therefore \angle DOC = 40^\circ}$

(10) $(\pm 9, 0)$, $(0, \pm 9)$