Q1. Express in standard form : a+ib

a) $(-\sqrt{-1})^{4n+3}$

b) $i^n+i^{n+1}+i^{n+2}+i^{n+3}$

c) $1+i^2+i^4+i^6\text{------}+i^{20}$

d) $(\sqrt{3}+\sqrt{-2})(2\sqrt{3}-i)$

e) $(1-2i)^{-3}$

f) $\dfrac{2-\sqrt{-25}}{1-\sqrt{-16}}$

Q2. Find x and y for $\dfrac{x-1}{3+i}+\dfrac{y-1}{3-i}=i$ $\qquad \begin{bmatrix} x = & -4 \\ y = & 6 \end{bmatrix}$

Q3. Find x and y for which the complex No. $-3+ix^2y$ and x^2+y+4i are conjugate of

each other $\qquad \begin{bmatrix} x = 1 & y = -4 \\ x = -1 & y = -4 \end{bmatrix}$

Q4. If $\dfrac{(a+i)^2}{(2a-i)}=p+iq$ to show $p^2+q^2=\dfrac{(a^2+1)^2}{4a^2+1}$

Q5. If $z_1\, z_2$ are complex no. such that $\dfrac{2z_1}{3z_2}$ is purely imaginary then

show $\left|\dfrac{z_1-z_2}{z_1+z_2}\right| = 1$

Q6. If x=-5+4i show that the value of $x^4+9x^3+35x^2-x+4$ is -160.

Q7. If $iz^3+z^2-z+i=0$ then show that $|z|=1$

Q8. Express in polar form.

a) Sin 120° - i Cos 120°

b) $\dfrac{2(i-1)}{1+i\sqrt{3}}$

Q9. Find θ for complex No. $\dfrac{1+i\cos\theta}{1-2\,i\cos\theta}$ is purely real.

Q10. Solve the Quad. Eqn (over C)

a) $x^2-\sqrt{2}\,i\,x + 12 = 0$ $\qquad \left[3\sqrt{2}i\ \& -2\sqrt{2}i\right]$

b) $2x^2+3ix+2=0$ $\qquad \left[\dfrac{i}{2}\ \& -2i\right]$

c) $2x^2-(3+7i)x-(3-9i)=0$ $\qquad \left[\dfrac{3+i}{2}\ \& \ 3i\right]$

d) $x^2-(7-i)x+(18-i)=0$ $\qquad [4-3i\ \&\ 3+2i]$