1) If $z = 2 + 3i$ then find $(z+3)^2$

2) Express in the form (a + ib)   :   a) $\dfrac{(4+5i)^2}{(2+3i)^2}$ b) $\dfrac{(1+i)(3+2i)}{-4i}$

3) Express in polar form   :   a) $\dfrac{1}{2} - i\dfrac{\sqrt{3}}{2}$ $b)$ $\dfrac{2+6\sqrt{3}i}{5+\sqrt{3}i}$

4) Show that: $\dfrac{1+\sin\alpha+i\cos\alpha}{1+\sin\alpha-i\cos\alpha} = \sin\alpha + i\cos\alpha$

5) Find modulus and argument of: (3-5i) (-2+i).

6) Prove that: $(1 + i\sqrt{3})^{120} + (1 - i\sqrt{3})^{120} = 2^{121}$

7) Prove that: $(\dfrac{1}{\sqrt{2}} + i\dfrac{1}{\sqrt{2}})^{\frac{4}{3}} + (\dfrac{1}{\sqrt{2}} - i\dfrac{1}{\sqrt{2}})^{\frac{4}{3}} = 1$

8) Find tanh (x) if 10 sinh(x) -5 cosh(x) = 10

9) Find   :   a) $\text{Log}(1 + i)$ b) $\text{Log}-6$

                   $c)$ $\text{Log}(1 - i)(1 + i)$ d) $\text{Log}(2 + i\sqrt{3})(2{-}i\sqrt{3})$

10) Find all roots of   a) $x^3 - i = 0$ b) $x^4{+}1{=}0$ c) $(1{+}i)^{1/3}$

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