

7. Solve the following equations:

$$i) z^5 = -4\sqrt{2} - 4\sqrt{2}i.$$

$$ii) z^3 - 7 + 2i = 0.$$

$$z^5 = -4\sqrt{2} - 4\sqrt{2}i = (\sqrt{32+32})(\cos((5P/4+2Pk)/5) + i\sin((5P/4+2Pk)/5)) = (\sqrt{64})(\cos(5P/4+2Pk) + i\sin(5P/4+2Pk))$$

$$\cos A = -4\sqrt{2}/8 = -\sqrt{2}/2$$

$$\sin A = -4\sqrt{2}/8 = -\sqrt{2}/2$$

$$z = (\cos B + i\sin B)|z|$$

$$(\cos 5B + i\sin 5B)|z|^5 = (\sqrt{64})(\cos(5P/4) + i\sin(5P/4))$$

$$5B = 5P/4 + 2Pk$$

$$B = (5P/4 + 2Pk) / 5$$

$$|z|^5 = 8$$

$$|z| = \sqrt[5]{8} = 2^{3/5}$$

$$k=0: B = (5P/4) / 5 = P/4$$

$$k=1: B = (5P/4 + 2P) / 5 = 12P/20$$

$$k=2: B = (5P/4 + 4P) / 5 = 21P/20$$

$$k=3: B = (5P/4 + 6P) / 5 = 29P/20$$

$$k=4: B = (5P/4 + 8P) / 5 = 37P/20$$

$$k=5: B = (5P/4 + 10P) / 5 = 9P/4$$

$$z^3 - 7 + 2i = 0$$

$$z^3 = 7 - 2i$$

$$z^3 = \sqrt{49+4}(\cos((\arctan(-2/7)+2Pk)) + i\sin((\arctan(-2/7)+2Pk)))$$

$$z = \sqrt[3]{53}(\cos((\arctan(-2/7)+2Pk)/3) + i\sin((\arctan(-2/7)+2Pk)/3))$$

$$z_1 = \sqrt[3]{53}(\cos((\arctan(-2/7))/3) + i\sin((\arctan(-2/7))/3))$$

$$z_2 = \sqrt[3]{53}(\cos((\arctan(-2/7)+2P)/3) + i\sin((\arctan(-2/7)+2P)/3))$$

$$z_3 = \sqrt[3]{53}(\cos((\arctan(-2/7)+4P)/3) + i\sin((\arctan(-2/7)+4P)/3))$$