

$$1) \quad 3(\cos 150^\circ + i \sin 150^\circ) \quad 4(\cos 30^\circ + i \sin 30^\circ)$$

$$(-3\sqrt{3} + 3i) \quad (4\sqrt{3}, 2)$$

$$d = \sqrt{(4\sqrt{3} - (-3\sqrt{3}))^2 + (2 - 3)^2} = \sqrt{(7\sqrt{3})^2 + (-1)^2} = \sqrt{\frac{147}{4} + \frac{1}{4}}$$

$$= \sqrt{\frac{148}{4}} = \sqrt{37} \quad \boxed{D}$$

$$2) \quad (-2, \frac{\pi}{6}) = (2, \frac{7\pi}{6}) \neq (2, \frac{\pi}{6}) \quad \boxed{B}$$

$$3) \quad (2, -120^\circ) = 2(\cos(-120^\circ) + i \sin(-120^\circ)) = [2\text{II}] = \boxed{A}$$

$\xrightarrow{-120^\circ}$

$$\phi$$

$$(-3, 120^\circ) = [3\text{II}] = \boxed{B}$$

$$4) \quad (-2, -1) \quad r = \sqrt{8} = 2\sqrt{2} \quad (2\sqrt{2}, 225^\circ) \quad \boxed{C}$$

$\xrightarrow{225^\circ}$

$$\theta = \frac{5\pi}{4} = 225^\circ \quad \equiv (-2\sqrt{2}, -2\sqrt{2})$$

$\xrightarrow{225^\circ - 315^\circ}$

$$\equiv (2\sqrt{2}, -135^\circ)$$

$$\neq (-2\sqrt{2}, 135^\circ)$$

$$5) \quad (1, -\sqrt{3})$$

$$r = \sqrt{1^2 + (-\sqrt{3})^2} = 2$$

$$\theta = 300^\circ = 2(\cos 300^\circ + i \sin 300^\circ) \quad \boxed{C}$$

$\xrightarrow{300^\circ}$

$$\theta = \frac{5\pi}{3}$$

$$= (2, \frac{5\pi}{3})$$

$$= (2, -\frac{\pi}{3})$$

$$6) (-4, \frac{3\sqrt{2}}{2}) = (-4, 135^\circ) = (2\sqrt{2}, -2\sqrt{2}) \quad [B]$$

$$= -4(\cos 135^\circ + j\sin 135^\circ)$$

$$= -\sqrt{2} \frac{-\sqrt{2}}{2} + j\sqrt{2} \frac{\sqrt{2}}{2}$$

$$7) (-1, \frac{\sqrt{2}}{2}) = -1(\cos 225^\circ + j\sin 225^\circ) \quad [D]$$

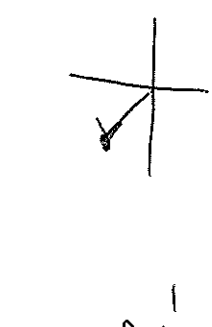
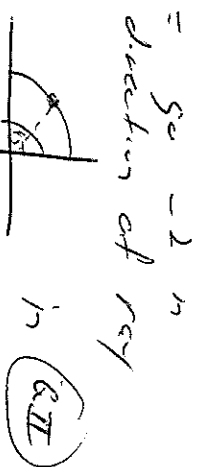
$$(+\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$$

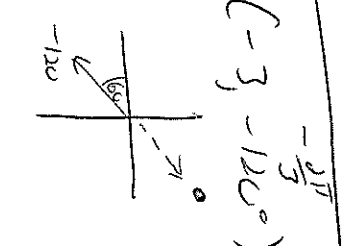
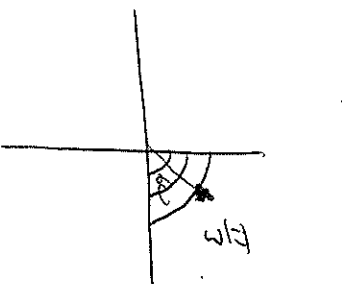
$$8) (4, \frac{\sqrt{2}}{2}) = 4(\cos 30^\circ + j\sin 30^\circ) \quad [A]$$

$$= (4, 4)$$

$$9) -4(\cos 210^\circ + j\sin 210^\circ) = (2\sqrt{3}, 2) \quad [GI]$$

$$(-\sqrt{3}, -2)$$

$$10) \text{ angle } 15^\circ - \frac{\sqrt{2}}{2} \quad -2 \text{ for } r = \text{so } -2 \text{ in opposite direction of ray}$$



$$11) (-3, -120^\circ) \quad -\frac{2\sqrt{3}}{3}$$



$$11a) (-3, -\frac{2\sqrt{3}}{3}) = (3, \frac{2\sqrt{3}}{3}), (3, \frac{2\sqrt{3}}{3})$$

$$(3, 60^\circ), (3, 420^\circ), (3, -300^\circ)$$

$$12) (4, 0) = 4(\cos 0^\circ + j\sin 0^\circ) = [4, 0]$$

$$\sqrt{4^2 + 0^2} = 4$$

$$13) (0, -1) = (2, 270^\circ) = (2, \frac{3\sqrt{2}}{2})$$

$$r = \sqrt{0^2 + (-1)^2} = 1$$

$$\theta = 170^\circ$$

