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Page 7 of 8

$$r = \sqrt{1.23^2 + 0.811^2} = 1.47$$

$$\theta = \tan^{-1}\left(\frac{y}{x}\right) \therefore \theta = \tan^{-1}\left(\frac{0.811}{1.23}\right) = 33.4$$

$$\text{Polar expression} = r(\cos\theta + j\sin\theta)$$

$$\therefore = 1.47 \times (\cos(33.4) + j\sin(33.4))$$

a.

$$r(\cos\theta - j\sin\theta)$$

$$\theta = 360 - 33.4 = 326.6$$

$$\therefore \text{expression} = 1.47 \times (\cos(326.6) - j\sin(326.6))$$

(c)

(i).

$$(4 + 9j)^4$$

$\uparrow \quad \uparrow$
x real imaginary y

$$\text{DMT} = r^n (\cos n\theta + j\sin n\theta)$$

$$r = \sqrt{x^2 + y^2}$$
$$\therefore = \sqrt{4^2 + 9^2} = 9.85$$

$$\theta = \tan^{-1}\left(\frac{y}{x}\right) \therefore \tan^{-1}\left(\frac{9}{4}\right) = 66.03$$

$$\therefore 9.85^4 \times (\cos(4 \times 66.03) + j\sin(4 \times 66.03)) =$$

$$\therefore 9413.37 \times (\cos(264.08) + j\sin(264.08))$$

$$\therefore 9413.37 \cos 264.08 = -970.89$$

$$\therefore 9413.37 \sin 264.08 = -9363.167$$

$$= -970.89 - 9363.167j$$