

$$\begin{aligned} ① (\cos \theta + i \sin \theta)^2 \\ = \cos 2\theta + i \sin 2\theta \quad \text{مبرهنة دي موافر} \\ = (\cos 0 + i \sin 0)^2 \quad \text{أربعاء الذئب} \end{aligned}$$

$$\begin{aligned} ② (\cos 3\theta + i \sin 3\theta) \\ = (\cos 0 + i \sin 0)^3 \end{aligned}$$

$$\begin{aligned} ③ (\cos 4\theta + i \sin 4\theta) \\ = (\cos 0 + i \sin 0)^4 \end{aligned}$$

$$\begin{aligned} ④ (\cos \theta - i \sin \theta) \\ = (\cos 0 + i \sin 0)^{-1} \end{aligned}$$

$$\frac{(x+yi)(2-i)}{2-i} = \frac{-10+10i}{2-i}$$

$$x+yi = \frac{-10+10i}{2-i} \cdot \frac{2+i}{2+i}$$

$$x+yi = \frac{-20-10i+20i-10}{5}$$

$$x+yi = -\frac{30}{5} + \frac{10i}{5}$$

$$x+yi = -6 + 2i$$

$$x = -6$$

$$y = 2$$

وزاري 2022 الدور الأول الرياضيات
من جد قيمة $x, y \in \mathbb{R}$ اذا علمت أنه:

$$(x+yi)(2-i) = 10\sqrt{2} (\cos \frac{\pi}{4} + i \sin \frac{\pi}{4})$$

$$(x+yi)(2-i) = 10\sqrt{2} (\cos 1\frac{\pi}{4} + i \sin 1\frac{\pi}{4})$$

$$(x+yi)(2-i) = 10\sqrt{2} (\cos 3\frac{\pi}{4} + i \sin 3\frac{\pi}{4})$$

$$(x+yi)(2-i) = 10\sqrt{2} (-\cos \frac{\pi}{4} + i \sin \frac{\pi}{4})$$

$$(x+yi)(2-i) = 10\sqrt{2} (-\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}i)$$

$$(x+yi)(2-i) = -\frac{10\sqrt{2}}{\sqrt{2}} + \frac{10\sqrt{2}}{\sqrt{2}}i$$

وزاري 2017 دور الاول

هـ / أبتي أن :-

$$\frac{(\cos 3\theta + i \sin 3\theta)^4}{(\cos 5\theta + i \sin 5\theta)^2} \cdot (\cos \theta - i \sin \theta)^2 = 1$$

$$h-h-s = \frac{(\cos \theta + i \sin \theta)^{12}}{(\cos \theta + i \sin \theta)^{10}} \cdot (\cos \theta + i \sin \theta)^{-2}$$

$$= (\cos \theta + i \sin \theta)^2 \cdot (\cos \theta + i \sin \theta)^{-2}$$

$$= (\cos \theta + i \sin \theta)^0$$

$$= 1$$

$$= R-h-s$$

هـ / أبتي ما يلي :-

$$(\cos \theta + i \sin \theta)^8 (\cos \theta - i \sin \theta)^4$$

$$= (\cos \theta + i \sin \theta)^8 (\cos \theta + i \sin \theta)^{-4}$$

$$= (\cos \theta + i \sin \theta)^4$$

$$= \cos 4\theta + i \sin 4\theta$$

وزاري 2013 دور الثاني

هـ / أبتي ما يلي :-

$$\frac{(\cos 5\theta + i \sin 5\theta)^2}{(\cos 3\theta + i \sin 3\theta)^3}$$

$$= \frac{(\cos \theta + i \sin \theta)^{10}}{(\cos \theta + i \sin \theta)^9}$$

$$= \cos \theta + i \sin \theta$$

وزارة 2022 الدور الأول الدراسة التكميلية.

س/ إذا كان $x = \cos 13\frac{\pi}{8} + i \sin 13\frac{\pi}{8}$, $y = \cos 9\frac{\pi}{8} + i \sin 9\frac{\pi}{8}$

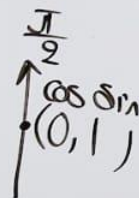
جد بالصيغة العادية $\frac{x}{y}$.

$$\begin{aligned}\frac{x}{y} &= \frac{\cos 13\frac{\pi}{8} + i \sin 13\frac{\pi}{8}}{\cos 9\frac{\pi}{8} + i \sin 9\frac{\pi}{8}} \\ &= \frac{(\cos \frac{\pi}{8} + i \sin \frac{\pi}{8})^{13}}{(\cos \frac{\pi}{8} + i \sin \frac{\pi}{8})^9} \\ &= (\cos \frac{\pi}{8} + i \sin \frac{\pi}{8})^4 \\ &= \cos 4\frac{\pi}{8} + i \sin 4\frac{\pi}{8} \\ &= \cos \frac{\pi}{2} + i \sin \frac{\pi}{2} = 0 + i\end{aligned}$$

وزارة 2022 الدور الثاني

س/ أكتب بأستخدام جبرهنة دي موافر أو التقييم:

$$\begin{aligned}& (\cos 13\frac{\pi}{8} + i \sin 13\frac{\pi}{8})(\cos 9\frac{\pi}{8} - i \sin 9\frac{\pi}{8}) \\ &= (\cos \frac{\pi}{8} + i \sin \frac{\pi}{8})^{13} (\cos \frac{\pi}{8} - i \sin \frac{\pi}{8})^9 \\ &= (\cos \frac{\pi}{8} + i \sin \frac{\pi}{8})^4 \\ &= \cos 4\frac{\pi}{8} + i \sin 4\frac{\pi}{8} \\ &= \cos \frac{\pi}{2} + i \sin \frac{\pi}{2} \\ &= 0 + i\end{aligned}$$



سأين الزاوية

$$\sin 2x = 2 \sin x \cos x$$

$$\cos 2x = \boxed{\cos^2 x} - \boxed{\sin^2 x}$$

$$= 1 - \sin^2 x - \sin^2 x$$
$$= 1 - 2\sin^2 x$$

$$= \cos^2 x - (1 - \cos^2 x)$$

$$= \cos^2 x - 1 + \cos^2 x$$

$$= 2\cos^2 x - 1$$

$$\tan x = \frac{\sin x}{\cos x}, \cot x = \frac{\cos x}{\sin x}$$

$$\sin^2 x + \cos^2 x = 1$$

$$\sin^2 x = (1 - \cos^2 x)$$

$$\cos^2 x = (1 - \sin^2 x)$$

$$\sin 2x = 2 \sin x \cos x$$

$$\cos 2x = \cos^2 x - \sin^2 x$$

$$= 1 - 2\sin^2 x$$

$$= 2\cos^2 x - 1$$

$$\sin 2x = 2 \sin x \cos x$$

$$\cos 2x = \cos^2 x - \sin^2 x$$

$$\cos 2x = 1 - 2\sin^2 x$$

$$\cos 2x = 2\cos^2 x - 1$$

وزارة 2019 الدور الأول خارج

$Z = \cos 2x + i \sin 2x$ من إذا كان

$\frac{2}{1+Z} = 1 - i \tan x$ أثبت أن: الهدف

$$\begin{aligned} L.H.S. &= \frac{2}{1+Z} = \frac{2}{1+\cos 2x + i \sin 2x} \\ &= \frac{2}{1+2\cos^2 x - 1 + i \cdot 2\sin x \cos x} \\ &= \frac{2\cos x (\cos x + i \sin x)}{(\cos x + i \sin x)^2} \\ &= \frac{\cos x - i \sin x}{\cos x} \\ &= 1 - i \tan x = R.H.S \end{aligned}$$

وزارة 2019 الدور الثاني

$Z = \cos \theta + i \sin \theta$ من إذا كان

$\frac{Z^n}{1+Z^{2n}} = \frac{1}{2\cos n\theta}$ أثبت أن: الهدف

$$\begin{aligned} L.H.S. &= \frac{Z^n}{1+Z^{2n}} = \frac{1}{Z^{-n}(1+Z^{2n})} \\ &= \frac{1}{Z^{-n} + Z^n} \\ &= \frac{1}{(\cos \theta + i \sin \theta)^{-n} + (\cos \theta + i \sin \theta)^n} \\ &= \frac{1}{\cos n\theta - i \sin n\theta + \cos n\theta + i \sin n\theta} \\ &= \frac{1}{2\cos n\theta} = R.H.S \end{aligned}$$

وزارة 2018 الدور الأول خارج

$Z = \cos \theta + i \sin \theta$ من إذا كان

$(1+\bar{Z})Z = 1+Z$ أثبت أن: الهدف

$$\begin{aligned} L.H.S. &= (1+\bar{Z}) \cdot Z \\ &= Z + Z \cdot \bar{Z} \\ &= (\cos \theta + i \sin \theta) + (\cos \theta + i \sin \theta)(\cos \theta + i \sin \theta) \\ &= (\cos \theta + i \sin \theta) + (\cos \theta + i \sin \theta)(\cos \theta - i \sin \theta) \\ &= (\cos \theta + i \sin \theta) + (\cos \theta + i \sin \theta)(\cos \theta + i \sin \theta)^{-1} \\ &= (\cos \theta + i \sin \theta) + (\cos \theta + i \sin \theta)^0 \\ &= Z + 1 \\ &= 1+Z = R.H.S \end{aligned}$$