Activités mentales ex 7 page 248

Sésamath

Maths TS obligatoire

énoncé

Mettre les résultats des opérations suivantes sous forme exponentielle :

1. $e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}}$
2. $\dfrac{1}{e^{i\frac{\pi}{7}}}$
3. $\dfrac{e^{i\frac{\pi}{5}}}{e^{4i\frac{\pi}{5}}}$
4. $\left(e^{2i\frac{\pi}{9}}\right)^2$
5. $\left(e^{i\frac{\pi}{3}}\right)^3$
6. $e^{-i\frac{\pi}{6}} \times e^{i\frac{\pi}{3}}$

correction

Rappel

Pour tous nombres réels θ_1, θ_2 :

1. $e^{i\theta_1} \times e^{i\theta_2} = e^{i(\theta_1+\theta_2)}$
2. $\left(e^{i\theta_1}\right)^n = e^{in\theta_1}, \quad n \in \mathbb{Z}$
3. $\dfrac{1}{e^{i\theta_1}} = e^{-i\theta_1} = \overline{e^{i\theta_1}}$
4. $\dfrac{e^{i\theta_1}}{e^{i\theta_2}} = e^{i(\theta_1-\theta_2)}$

correction

1

$$e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}}$$

correction

1

$$e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}} = e^{i\left(\frac{2\pi}{6}+\frac{3\pi}{6}\right)}$$

correction

1

$$e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}} = e^{i\left(\frac{2\pi}{6}+\frac{3\pi}{6}\right)}$$
$$= e^{i\frac{5\pi}{6}}$$

correction

1

$$e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}} = e^{i\left(\frac{2\pi}{6}+\frac{3\pi}{6}\right)}$$
$$= e^{i\frac{5\pi}{6}}$$

2

$$\frac{1}{e^{i\frac{\pi}{7}}}$$

correction

1

$$e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}} = e^{i\left(\frac{2\pi}{6}+\frac{3\pi}{6}\right)}$$
$$= e^{i\frac{5\pi}{6}}$$

2

$$\frac{1}{e^{i\frac{\pi}{7}}} = e^{-i\frac{\pi}{7}}$$

correction

1

$$e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}} = e^{i\left(\frac{2\pi}{6}+\frac{3\pi}{6}\right)}$$
$$= e^{i\frac{5\pi}{6}}$$

2

$$\frac{1}{e^{i\frac{\pi}{7}}} = e^{-i\frac{\pi}{7}}$$

3

$$\frac{e^{i\frac{\pi}{5}}}{e^{4i\frac{\pi}{5}}}$$

correction

1

$$e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}} = e^{i\left(\frac{2\pi}{6}+\frac{3\pi}{6}\right)}$$
$$= e^{i\frac{5\pi}{6}}$$

2

$$\frac{1}{e^{i\frac{\pi}{7}}} = e^{-i\frac{\pi}{7}}$$

3

$$\frac{e^{i\frac{\pi}{5}}}{e^{4i\frac{\pi}{5}}} = e^{i\left(\frac{\pi}{5}-\frac{4\pi}{5}\right)}$$

correction

1

$$e^{2i\frac{\pi}{6}} \times e^{3i\frac{\pi}{6}} = e^{i\left(\frac{2\pi}{6}+\frac{3\pi}{6}\right)}$$
$$= e^{i\frac{5\pi}{6}}$$

2

$$\frac{1}{e^{i\frac{\pi}{7}}} = e^{-i\frac{\pi}{7}}$$

3

$$\frac{e^{i\frac{\pi}{5}}}{e^{4i\frac{\pi}{5}}} = e^{i\left(\frac{\pi}{5}-\frac{4\pi}{5}\right)}$$
$$= e^{-i\frac{3\pi}{5}}$$

correction

4

$$\left(e^{2i\frac{\pi}{9}}\right)^2$$

correction

4

$$\left(e^{2i\frac{\pi}{9}}\right)^2 = e^{4i\frac{\pi}{9}}$$

correction

4

$$\left(e^{2i\frac{\pi}{9}}\right)^2 = e^{4i\frac{\pi}{9}}$$

5

$$\left(e^{i\frac{\pi}{3}}\right)^3$$

correction

4

$$\left(e^{2i\frac{\pi}{9}}\right)^2 = e^{4i\frac{\pi}{9}}$$

5

$$\left(e^{i\frac{\pi}{3}}\right)^3 = e^{i\frac{3\pi}{3}}$$

correction

4

$$\left(e^{2i\frac{\pi}{9}}\right)^2 = e^{4i\frac{\pi}{9}}$$

5

$$\left(e^{i\frac{\pi}{3}}\right)^3 = e^{i\frac{3\pi}{3}}$$
$$= e^{i\pi}$$

correction

4

$$\left(e^{2i\frac{\pi}{9}}\right)^2 = e^{4i\frac{\pi}{9}}$$

5

$$\left(e^{i\frac{\pi}{3}}\right)^3 = e^{i\frac{3\pi}{3}}$$
$$= e^{i\pi}$$

6

$$e^{-i\frac{\pi}{6}} \times e^{i\frac{\pi}{3}}$$

correction

4

$$\left(e^{2i\frac{\pi}{9}}\right)^2 = e^{4i\frac{\pi}{9}}$$

5

$$\left(e^{i\frac{\pi}{3}}\right)^3 = e^{i\frac{3\pi}{3}}$$
$$= e^{i\pi}$$

6

$$e^{-i\frac{\pi}{6}} \times e^{i\frac{\pi}{3}} = e^{i\left(-\frac{\pi}{6}+\frac{\pi}{3}\right)}$$

correction

4

$$\left(e^{2i\frac{\pi}{9}}\right)^2 = e^{4i\frac{\pi}{9}}$$

5

$$\left(e^{i\frac{\pi}{3}}\right)^3 = e^{i\frac{3\pi}{3}}$$
$$= e^{i\pi}$$

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$$e^{-i\frac{\pi}{6}} \times e^{i\frac{\pi}{3}} = e^{i\left(-\frac{\pi}{6}+\frac{\pi}{3}\right)}$$
$$= e^{i\frac{\pi}{6}}$$