Exercice 1

a) Calculer $\sin(\alpha)$ et $\tan(\alpha)$ sachant que $\cos(\alpha) = \frac{4}{7}$.

b) Calculer $\cos(\alpha)$ et $\tan(\alpha)$ sachant que $\sin(\alpha) = \frac{3}{8}$.

c) Calculer $\cos(\alpha)$ et $\sin(\alpha)$ sachant que $\tan(\alpha) = 6$.

d) Calculer $\cos(\alpha)$ et $\tan(\alpha)$ sachant que $\sin(\alpha) = \frac{4}{3}$.

Corrigé 1 *Generated by AI*

a) $\cos(\alpha) = \frac{4}{7}$

En utilisant l'identité fondamentale $\sin^2(\alpha) + \cos^2(\alpha) = 1$:

$$\sin^2(\alpha) = 1 - \cos^2(\alpha) = 1 - \left(\frac{4}{7}\right)^2 = 1 - \frac{16}{49} = \frac{33}{49}$$

$$\boxed{\sin(\alpha) = \pm\frac{\sqrt{33}}{7}}$$

$$\boxed{\tan(\alpha) = \frac{\sin(\alpha)}{\cos(\alpha)} = \pm\frac{\sqrt{33}/7}{4/7} = \pm\frac{\sqrt{33}}{4}}$$

b) $\sin(\alpha) = \frac{3}{8}$

$$\cos^2(\alpha) = 1 - \sin^2(\alpha) = 1 - \left(\frac{3}{8}\right)^2 = 1 - \frac{9}{64} = \frac{55}{64}$$

$$\boxed{\cos(\alpha) = \pm\frac{\sqrt{55}}{8}}$$

$$\boxed{\tan(\alpha) = \frac{\sin(\alpha)}{\cos(\alpha)} = \pm\frac{3/8}{\sqrt{55}/8} = \pm\frac{3}{\sqrt{55}} = \pm\frac{3\sqrt{55}}{55}}$$

c) $\tan(\alpha) = 6$

On sait que $\tan(\alpha) = \frac{\sin(\alpha)}{\cos(\alpha)} = 6$, donc $\sin(\alpha) = 6\cos(\alpha)$.

En utilisant $\sin^2(\alpha) + \cos^2(\alpha) = 1$:

$$(6\cos(\alpha))^2 + \cos^2(\alpha) = 1$$

$$36\cos^2(\alpha) + \cos^2(\alpha) = 1$$

$$37\cos^2(\alpha) = 1$$

$$\boxed{\cos(\alpha) = \pm\frac{1}{\sqrt{37}} = \pm\frac{\sqrt{37}}{37}}$$

$$\boxed{\sin(\alpha) = 6\cos(\alpha) = \pm\frac{6}{\sqrt{37}} = \pm\frac{6\sqrt{37}}{37}}$$

d) $\sin(\alpha) = \frac{4}{3}$

Attention : Cette valeur est impossible car $|\sin(\alpha)| \leq 1$ toujours.

$\boxed{\text{Aucune solution (valeur impossible)}}$