

Devoir: Omnimaths 12, pages 252-253, nos 2, 8, 10, 22-28, 31, 32a, 33b, 34abc, 35a, (défi : 37ab)

Isole θ dans chaque équation, $0 \leq \theta < 2\pi$.

2. $\sin \theta + 0,5 = 0$

$\sin \theta = -0,5$

$210^\circ, 330^\circ$

$\left\{ \frac{7\pi}{6}, \frac{11\pi}{6} \right\}$



8. $0,5 \cos \theta - 0,5 = 0$

$\cos \theta = 1$

0



10. $\sec \theta = -2$

$\frac{1}{\cos \theta} = -2$

$\cos \theta = \frac{-1}{2}$

$120^\circ, 240^\circ$

$\left\{ \frac{2\pi}{3}, \frac{4\pi}{3} \right\}$



Isole x dans chaque équation, $0 \leq \theta < 2\pi$. Indique ensuite la solution générale.

22. $\sin^2 x - 1 = 0$

$\sin x - 1 \quad \sin x + 1 = 0$

$\sin x = 1 \quad \sin x = -1$

$\frac{\pi}{2}, \frac{3\pi}{2}$

$\left\{ \frac{\pi}{2} \pm n\pi; n \in \mathbb{Z} \right\}$

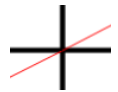


23. $\sin x \sin x + 1 = 0$

$\sin x = 0 \quad \sin x = -1$

$x = 0, \pi, \frac{3\pi}{2}$

$\left\{ 0 \pm \pi n, \frac{3\pi}{2} \pm 2\pi n; n \in \mathbb{Z} \right\}$



24. $\cos^2 x - 0,25 = 0$

$\cos^2 x = 0,25$

$\cos x = \pm 0,5$

$60^\circ, 120^\circ, 240^\circ, 300^\circ$

$\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

$\left\{ \frac{\pi}{3} \pm \pi n, \frac{2\pi}{3} \pm \pi n, n \in \mathbb{Z} \right\}$



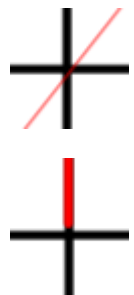
25. $\sin x - 1 \quad \tan x - 1 = 0$

$\sin x = 1 \quad \tan x = 1$

$90^\circ \quad 45^\circ, 225^\circ$

$\frac{\pi}{2}, \frac{\pi}{4}, \frac{5\pi}{4}$

$\left\{ \frac{\pi}{2} \pm 2\pi n, \frac{\pi}{4} \pm \pi n, n \in \mathbb{Z} \right\}$



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26. $2 \cos^2 x + \cos x - 1 = 0$

$$2 \cos x + 2 \quad 2 \cos x - 1 \quad / 2 = 0$$

$$2 \cos x + 1 \quad 2 \cos x - 1 \quad / 2 = 0$$

$$\cos x = -1 \quad \cos x = \frac{1}{2}$$

$$180^\circ \quad 60^\circ, 300^\circ$$

$$\pi, \frac{\pi}{3}, \frac{5\pi}{3}$$

$$\left\{ \frac{\pi}{3} \pm \frac{2\pi}{3} n, n \in \mathbb{Z} \right\}$$



27. $2 \sin^2 x + \sin x = 1$

$$2 \sin x + 2 \quad 2 \sin x - 1 \quad / 2 = 0$$

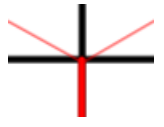
$$2 \sin x + 1 \quad 2 \sin x - 1 \quad / 2 = 0$$

$$\sin x = -1 \quad \sin x = \frac{1}{2}$$

$$270^\circ \quad 30^\circ, 150^\circ$$

$$\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$$

$$\left\{ \frac{\pi}{6} \pm \frac{2\pi}{3} n, n \in \mathbb{Z} \right\}$$



28. $2 \cos^2 x - \cos x - 1 = 0$

$$2 \cos x - 2 \quad 2 \cos x + 1 \quad / 2 = 0$$

$$2 \cos x - 1 \quad 2 \cos x + 1 \quad / 2 = 0$$

$$\cos x = 1 \quad \cos x = \frac{-1}{2}$$

$$0^\circ \quad 120^\circ, 240^\circ$$

$$0, \frac{2\pi}{3}, \frac{4\pi}{3}$$

$$\left\{ 0 \pm \frac{2\pi}{3} n, n \in \mathbb{Z} \right\}$$



31. $4 \sin^2 x - 3 = 0$

$$\sin^2 x = \frac{3}{4}$$

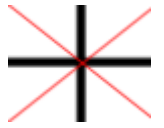
$$\sin x = \frac{\pm\sqrt{3}}{2}$$

$$\sin x = \frac{\sqrt{3}}{2} \quad \sin x = \frac{-\sqrt{3}}{2}$$

$$60^\circ, 120^\circ \quad 240^\circ, 300^\circ$$

$$\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$$

$$\left\{ \frac{\pi}{3} \pm \pi n, \frac{2\pi}{3} \pm \pi n, n \in \mathbb{Z} \right\}$$



32. Détermine toutes les racines exactes de chaque équation.

a) $\cos x - 2 \sin x \cos x = 0$

$$\cos x (1 - 2 \sin x) = 0$$

$$\cos x = 0 \quad \sin x = \frac{1}{2}$$

$$x = 90^\circ, 270^\circ \quad x = 30^\circ, 150^\circ$$

$$30^\circ \pm 120^\circ n, 90^\circ \pm 360^\circ n$$



33. Résous chaque équation dans l'intervalle $0 \leq \theta < 2\pi$. Représente graphiquement tes réponses pour les vérifier.

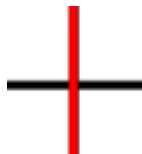
b) $\sin^2 x + \sin x - 2 = 0$

$$\sin x + 2 \quad \sin x - 1 = 0$$

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

$$x = \emptyset \quad x = \frac{\pi}{2}, \frac{3\pi}{2}$$

$$\left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$$



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34. Résous chaque équation si $0 \leq \theta < 2\pi$. Arrondis tes réponses au dixième.

a) $4 \cos^2 x = \cos x$

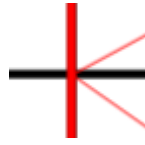
$$4 \cos^2 x - \cos x = 0$$

$$\cos x \ 4 \cos x - 1 = 0$$

$$\cos x = 0 \quad \cos x = \frac{1}{4}$$

$$x = 90^\circ, 270^\circ \quad x = 75,5^\circ, 284,5^\circ$$

$$1,3; 1,6; 4,7; 5,0$$



b) $\sec x \sin x = 2 \sin x$

$$\frac{1}{\cos x} \sin x - 2 \sin x = 0$$

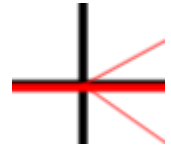
$$\sin x - 2 \sin x \cos x = 0$$

$$\sin x \ 1 - 2 \cos x = 0$$

$$\sin x = 0 \quad \cos x = \frac{1}{2}$$

$$x = 0^\circ, 180^\circ \quad x = 60^\circ, 300^\circ$$

$$0; 1; 3,1; 5,2$$



c) $\sin^2 x + \sin x - 1 = 0$

$$\text{si } \sin x = a$$

$$a^2 + a - 1 = 0$$

$$a = \frac{-1 \pm \sqrt{1 - 4 \cdot 1 \cdot -1}}{2}$$

$$a = \frac{-1 \pm \sqrt{5}}{2}$$

$$a = 0,6180 \quad \text{ou} \quad a = -1,6180$$

$$\sin x = 0,6180 \quad \text{ou} \quad \sin x = -1,6180$$

$$x = 38,1702^\circ, 142,8298^\circ \quad x = \emptyset$$

$$0,6662; 2,4929$$

35. Résous chaque équation si $0 \leq \theta < 2\pi$. Arrondis tes solutions au dix-millième.

a) $5 \tan^2 x + 2 \tan x - 7 = 0$

$$\text{si } \tan x = a$$

$$5a^2 + 2a - 7 = 0$$

$$a = \frac{-2 \pm \sqrt{4 - 4 \cdot 5 \cdot -7}}{10}$$

$$a = \frac{-2 \pm \sqrt{144}}{10} = \frac{-2 \pm 12}{10}$$

$$a = 1 \quad \text{ou} \quad a = -1,4$$

$$\tan x = 1 \quad \text{ou} \quad \tan x = -1,4$$

$$x = 45^\circ, 225^\circ \quad x = 125,5377; 305,5377$$

$$0,7854; 2,1910; 3,9270; 5,3326$$