

أكثر ب و أحل المسائل ٥٦

$$1) \sin x = \frac{1}{\sqrt{2}}$$

$$\sin x = 0,71$$

$$x = \sin^{-1}(0,71)$$

$$x = 45$$

$$\sin(+)$$

الأول

$$\theta' = \theta$$

$$45 = \theta$$

الثاني

$$\theta' = 180 - \theta$$

$$45 = 180 - \theta$$

$$-180 - 180$$

$$\theta = 135$$

$$\{45, 135\}$$

$$2) \tan x = \frac{1}{\sqrt{3}}$$

$$\tan x = 0,57$$

$$x = \tan^{-1}(0,57)$$

$$x = 30$$

$$\tan +$$

الأول

الأول

$$\theta' = \theta$$

$$30 = \theta$$

$$\theta' = \theta - 180$$

$$30 = \theta - 180$$

$$+180$$

$$\theta = 210$$

$$3) \cos x = \frac{\sqrt{3}}{2}$$

$$x = \cos^{-1}\left(\frac{\sqrt{3}}{2}\right) =$$

$$x = 30$$

$$\cos(+)$$

الأول

الأول

$$\theta' = 360 - \theta$$

$$30 = 360 - \theta$$

$$-360$$

$$\theta = 330$$

$$\theta' = \theta$$

$$30 = \theta$$

$$\{30, 330\}$$

$$4) \frac{7}{-4} + 9 \cos x = \frac{1}{-7}$$

$$\frac{9}{9} \cos x = \frac{-6}{9}$$

$$\cos x = -0,66$$

$$x = \cos^{-1}(-0,66)$$

$$x = 48$$

cos (-)

الزاوية

$$\theta' = \theta - 180$$

$$48 = \theta - 180 + 180$$

$$\theta = 228$$

الزاوية

$$\theta' = 180 - \theta$$

$$48 = 180 - \theta - 180 + 180$$

$$\theta = 132$$

$$5) \frac{2}{-2} \sin x = \frac{-1}{-1}$$

$$\sin x = -0,5$$

$$x = \sin^{-1}(-0,5) = 30$$

sin (-)

الزاوية

$$\theta' = 360 - \theta$$

$$30 = 360 - \theta - 360 + 360$$

$$\theta = 330$$

الزاوية

$$\theta' = \theta - 180$$

$$30 = \theta - 180 + 180$$

$$\theta = 210$$

$$6) \frac{1}{-1} - 2 \tan x = \frac{5}{-1}$$

$$\frac{-2}{-2} \tan x = \frac{4}{-2}$$

$$\tan x = -2$$

$$x = \tan^{-1}(2)$$

$$x = 63,4$$

tan (-)

الزاوية

$$\theta' = 360 - \theta$$

$$63,4 = 360 - \theta - 360 + 360$$

$$\theta = 296,6$$

الزاوية

$$\theta' = 180 - \theta$$

$$63,4 = 180 - \theta - 180 + 180$$

$$\theta = 116,6$$

$$0 < X < 90$$

$$7) 5 - 2 \cos(4X) = 4$$

$$\theta = 4X$$

$$5 - 2 \cos \theta = 4$$

$$-2 \cos \theta = -1$$

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

$$\theta = \cos^{-1}(0,5)$$

$$\theta = 60$$

cos +

الزاوية

$$\theta' = 360 - \theta$$

$$60 = 360 - \theta$$

$$\theta = 300$$

الزاوية

$$\theta' = \theta$$

$$\theta = 60$$

$$4X = \frac{60}{4}$$

$$X = 15$$

$$\theta = 300$$

$$4X = \frac{300}{4}$$

$$X = 75$$

$$8) 3 + 4 \tan(2X) = 6$$

$$\theta = 2X$$

$$3 + 4 \tan \theta = 6$$

$$4 \tan \theta = 3$$

$$\tan \theta = 0,75$$

$$\theta = \tan^{-1}(0,75) \approx 37$$

tan +

الزاوية

$$\theta' = \theta - 180$$

$$37 = \theta - 180$$

$$\theta = 216,8$$

الزاوية

$$\theta' = \theta$$

$$37 = \theta$$

$$\theta = 37$$

$$2X = \frac{37}{2}$$

$$X = 19$$

$$\theta = 216,8$$

$$2X = \frac{216,8}{2}$$

$$X = 108,4$$

$$9) 13 \sin(3X) + 1 = 6$$

$$\theta = 3X$$

$$13 \sin \theta + 1 = 6$$

$$13 \sin \theta = 5$$

$$\sin \theta = 0,38$$

$$\theta = \sin^{-1}(0,38) = 22,3$$

sin +

الزاوية

$$\theta' = 180 - \theta$$

$$22,3 = 180 - \theta$$

$$\theta = 157,7$$

الزاوية

$$\theta' = \theta$$

$$22,3 = \theta$$

$$\theta = 157,7$$

$$3X = \frac{157,7}{3}$$

$$X = 52,6$$

$$0 < X < 90$$

$$7) 5 - 2 \cos(4X) = 4$$

$$\theta = 4X$$

$$5 - 2 \cos \theta = 4$$

$$-2 \cos \theta = -1$$

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

$$\theta = \cos^{-1}(0,5)$$

$$\theta = 60$$

cos +

الاول

$$\theta' = 360 - \theta$$

$$60 = 360 - \theta$$

$$\theta = 300$$

الثاني

$$\theta' = \theta$$

$$60 = \theta$$

$$\theta = 60$$

$$4X = \frac{60}{4}$$

$$X = 15$$

$$\theta = 300$$

$$4X = \frac{300}{4}$$

$$X = 75$$

$$8) 3 + 4 \tan(2X) = 6$$

$$\theta = 2X$$

$$3 + 4 \tan \theta = 6$$

$$4 \tan \theta = 3$$

$$\tan \theta = 0,75$$

$$\theta = \tan^{-1}(0,75) \approx 37$$

tan +

الاول

$$\theta' = \theta - 180$$

$$37 = \theta - 180$$

$$\theta = 216,8$$

الثاني

$$\theta' = \theta$$

$$37 = \theta$$

$$\theta = 37$$

$$2X = \frac{37}{2}$$

$$X = 19$$

$$\theta = 216,8$$

$$2X = \frac{216,8}{2}$$

$$X = 108,4$$

$$9) 13 \sin(3X) + 1 = 6$$

$$\theta = 3X$$

$$13 \sin \theta + 1 = 6$$

$$13 \sin \theta = 5$$

$$\sin \theta = 0,38$$

$$\theta = \sin^{-1}(0,38) = 22,3$$

sint

الاول

$$\theta' = 180 - \theta$$

$$22,3 = 180 - \theta$$

$$\theta = 157,7$$

الثاني

$$\theta' = \theta$$

$$22,3 = \theta$$

$$\theta = 157,7$$

$$3X = \frac{157,7}{3}$$

$$X = 52,6$$

$$\theta = 22,3$$

$[0, 360]$

$$10) 2(\sin x - 2) + 1 = 3\sin x$$

$$2\sin x - 4 + 1 = 3\sin x$$

$$2\sin x - 3 = 3\sin x + 3$$

$$-3\sin x + 3 - 3\sin x$$

$$\boxed{\sin x = -3}$$

مجموعة الحل

لأن أعلى قيمة لـ $\sin x$ هي 1

أقل هي -1

$$11) \tan x - 3(2\tan x - 1) = 10$$

$$\tan x - 6\tan x + 3 = 10$$

$$-5\tan x = \frac{7}{-5}$$

$$\tan x = \frac{-7}{5}$$

$$\boxed{\tan x = -1,4}$$

$$x = \tan^{-1}(1,4)$$

$$\boxed{x = 54,5}$$

$\tan(-)$

الزاوية

$$\theta = 360 - \theta$$

$$54,5 = 360 - \theta$$

$$-360 \quad -360$$

$$\boxed{\theta = 305,5}$$

الزاوية

$$\theta' = 180 - \theta$$

$$54,5 = 180 - \theta$$

$$-180 \quad -180$$

$$\boxed{\theta = 125,5}$$

$$10) 2(\sin x - 2) + 1 = 3 \sin x$$

$$2 \sin x - 4 + 1 = 3 \sin x$$

$$-3 \sin x$$

$$-\sin x - 3 = 1$$

$$+3 \quad +$$

$$12) 15 \tan x - 5 = 5 \tan x - 3$$

$$-5 \tan x \quad +5 \quad -5 \tan x \quad +3$$

$$\frac{10 \tan x}{10} = \frac{4}{10}$$

$$\tan x = 0,4$$

$$x = \tan^{-1}(0,4)$$

$$x = 22$$

$\tan(+)$

الزاوية

$$\theta = 6 - 180$$

$$22 = \theta - 180$$

$$+180$$

$$\theta = 202$$

الزاوية

$$\theta = 6$$

$$22 = \theta$$

$$13) 5(\cos x - 1) = 6 + \cos x$$

$$5 \cos x - 5 = 6 + \cos x$$

$$- \cos x + 5 \quad +5 - \cos x$$

$$\frac{4 \cos x}{4} = \frac{11}{4}$$

$$\cos x = 2,75$$

أعلى قيمة (1)

$$(-1) = \text{أقل}$$

مجموعة الحل

$$14) \tan^2 x - 9 \tan x + 20 = 0$$

$$(\tan x - 5) (\tan x - 4) = 0$$

$$\tan x - 5 = 0$$

$$\tan x = 5$$

$$x = \tan^{-1}(5) = 78,6$$

$\tan +$

الثالث

$$\theta = \theta - 180$$

$$78,6 = \theta - 180$$

$$\theta = 258,6$$

الاول

$$\theta = \theta$$

$$78,6 = \theta$$

$$\tan x - 4 = 0$$

$$\tan x = 4$$

~~$\tan +$~~

$$x = \tan^{-1}(4)$$

$$x = 75,9$$

$\tan (+)$

الثالث

$$\theta = \theta - 180$$

$$75,9 = \theta - 180$$

$$\theta = 255$$

الاول

$$\theta = \theta$$

$$75,9 = \theta$$

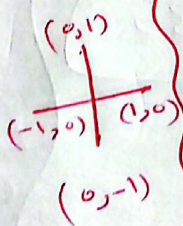
$$15) 2 \cos^2 x - \cos x = 0$$

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

$$\cos x = 0$$

$$x = 90$$

$$x = 270$$



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

$$2 \cos x = 1$$

$$\cos x = 0,5$$

$$x = \cos^{-1}(0,5)$$

$$x = 60$$

$\cos +$

الرابع

$$\theta = 360 - \theta$$

$$60 = 360 - \theta$$

$$\theta = 300$$

الاول

$$\theta = \theta$$

$$60 = \theta$$

$$16) 4\sin^2 x - 3\sin x = 1$$

$$4\sin^2 x - 3\sin x - 1 = 0$$

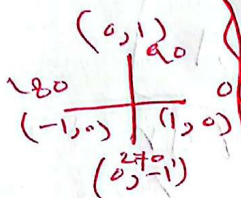
$$\sin^2 x - 3\sin x - 4 = 0$$

$$\left(\sin x - \frac{4}{1}\right) \left(\sin x + \frac{1}{4}\right) = 0$$

$$(\sin x - 1)(4\sin x + 1) = 0$$

$$\sin x - 1 = 0$$

$$\sin x = 1$$



$$x = 90$$

$$4\sin x + 1 = 0$$

$$4\sin x = -1$$

$$\sin x = -\frac{1}{4}$$

$$\sin x = -0,25$$

$$x = \sin^{-1} -0,25 = 14,4$$

sin (-)

الزاوية

الثاني

$$\theta = \theta - 180$$

$$14,4 = \theta - 180$$

$$\theta = 194,4$$

$$\theta = 360 - \theta$$

$$\theta = 345,6$$

$$17) 2\sin^2 x - 1 = 0$$

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

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

$$\sin^2 x = \frac{1}{2}$$

$$\sin x = \frac{1}{\sqrt{2}}$$

$$x = 45$$

sin +

الزاوية

الثاني

$$\theta = \theta$$

$$45 = \theta$$

$$\theta = 180 - \theta$$

$$45 = 180 - \theta$$

$$\theta = 135$$

تكملة الزاوية

$$\sin x = \frac{1}{\sqrt{2}} \theta = 45$$

الثاني

$$\theta = \theta - 180$$

$$45 = \theta - 180$$

$$\theta = 225$$

الزاوية

$$\theta = 360 - \theta$$

$$\theta = 315$$

$$18) \quad 4 \cos^2 x - 4 = 15 \cos x$$

$$\rightarrow 4 \cos^2 x - 15 \cos x - 4 = 0$$

$$\cos^2 x - 15 \cos x - 16 = 0$$

$$\left(\cos x - \frac{16}{4} \right) \left(\cos x + \frac{1}{4} \right) = 0$$

$$(\cos x - 4)(4 \cos x + 1) = 0$$

$$\cos x - 4 = 0$$

$$\cos x = 4$$

$$x = \cos^{-1}(4)$$

→ لا يوجد حل
 ↪ د

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

$$\frac{4 \cos x}{4} = \frac{-1}{4}$$

$$\cos x = -\frac{1}{4}$$

$$\cos x = -0,25$$

$$x = \cos^{-1}(-0,25)$$

$$x = 75,5$$

$$\cos x (-)$$

$$\text{الزاوية}$$

$$\theta = \theta - 180$$

$$75,5 = \theta - 180$$

$$\theta = 255,5$$

$$\text{الزاوية}$$

$$\theta = 180 - \theta$$

$$75,5 = 180 - \theta$$

$$\theta = 104,5$$

$$19) \frac{\cancel{\cos x}}{\cancel{\cos x}} = \frac{\sin x}{\cos x}$$

$$\tan x = 1$$

$$x = \tan^{-1}(1)$$

$$x = 45$$

$$\tan^+$$

الزاوية

$$\theta' = \theta - 180$$

$$45 = \theta - 180$$

$$+180$$

$$\theta = 225$$

الاول

$$\theta' = \theta$$

$$45 = \theta$$