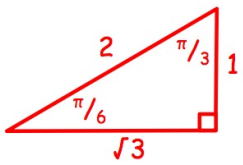
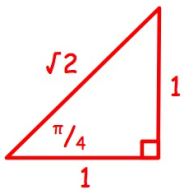
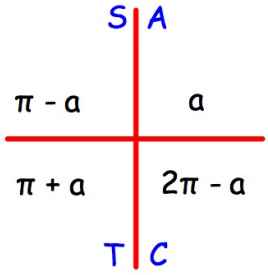
EXERCISE: TRIG. EQUATIONS







Solve for $0 \le x \le 2\pi$

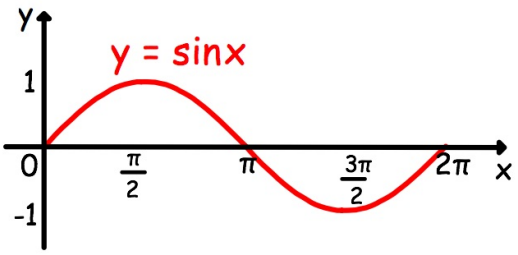
(1) $\sin x = {}^{1}/_{2}$ (2) $\cos x = {}^{1}/_{\sqrt{2}}$ (3) $\tan x = {}^{1}/_{\sqrt{3}}$

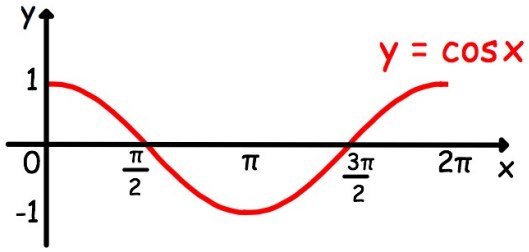
(4) $\cos x = {}^{1}/_{2}$ (5) $\sin x = {}^{\sqrt{3}}/_{2}$ (6) $\tan x = 1$

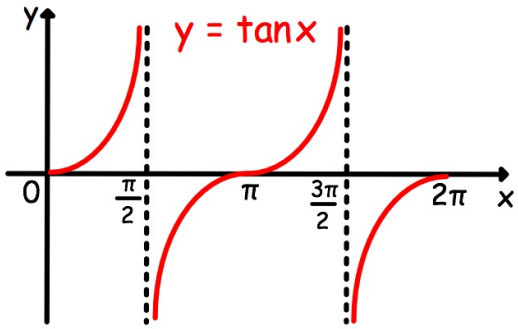
(7) $\tan x = \sqrt{3}$ (8) $\sin x = -{}^{1}/_{2}$ (9) $\sin x = -{}^{\sqrt{3}}/_{2}$

(10) $\tan x = -1$ (11) $\cos x = {}^{\sqrt{3}}/_{2}$ (12) $\tan x = -{}^{1}/_{\sqrt{3}}$

(13) $\sin x = -{}^{1}/_{\sqrt{2}}$ (14) $\cos x = -{}^{1}/_{2}$ (15) $\tan x = -\sqrt{3}$



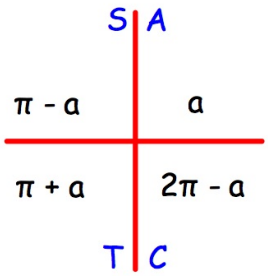


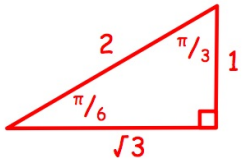


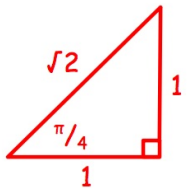
(16) $\sin x = 1$ (17) $\cos x = -1$ (18) $\cos x = 0$

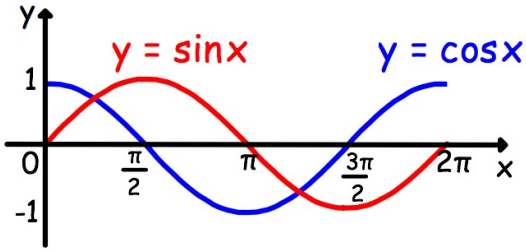
(19) $\sin x = -1$ (20) $\sin x = 0$ (21) $\cos x = 1$

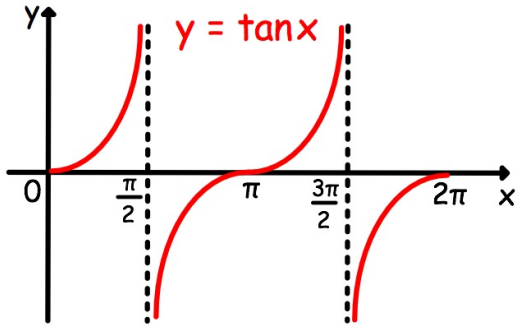
(22) $\tan x = 0$











EXERCISE: TRIG. EQUATIONS

Solve for $0 \le x \le 2\pi$

(1) $\sin x = {}^{1}/_{\sqrt{2}}$ (2) $\cos x = {}^{\sqrt{3}}/_{2}$ (3) $\sin x = -{}^{1}/_{2}$

Solve for $0 \le x \le \pi$

(4) $\sin 2x = {}^{1}/_{2}$ (5) $\cos 2x = 1$ (6) $\tan 2x = -1$

Solve for $0 \le x \le {}^{2\pi}/_{3}$

(7) $\cos 3x = {}^{1}/_{2}$ (8) $\tan 3x = -{}^{1}/_{\sqrt{3}}$ (9) $\sin 3x = 0$

Solve for $0 \le x \le 2\pi$

(10) $\sin (x - {}^{\pi}/_{9}) = {}^{\sqrt{3}}/_{2}$ (11) $\cos (x + {}^{\pi}/_{12}) = -{}^{1}/_{\sqrt{2}}$

Solve for $0 \le x \le \pi$

(12) $\cos (2x - {}^{\pi}/_{18}) = 0$ (13) $\sin (2x + {}^{\pi}/_{18}) = 1$

Solve correct to 3 significant figures.

Solve for $0 \le x \le 2\pi$

(14) $3 \sin x - 2 = 0$

(15) $5 \cos x + 3 = 2$

Solve for $0 \le x \le \pi$

(16) $4 \sin 2x + 1 = 2$

(17) $6 \tan 2x - 5 = -2$

Solve for $0 \le x \le 2\pi$

(18) $5 \cos (x - {}^{\pi}/_{18}) - 1 = 0$

(19) $3 \sin (x - {}^{\pi}/_{10}) + 2 = 1$

Solve for $0 \le x \le \pi$

(20) $6 \cos (2x - {}^{\pi}/_{20}) + 2 = 3$

(21) $4 \sin (2x + {}^{\pi}/_{9}) - 1 = 2$

EXERCISE: MULTIPLE ANGLES

Solve for $0 \le x \le 2\pi$

(1) $\cos 2x = -{}^{1}/_{2}$

(2) $\tan 2x = \sqrt{3}$

(3) $\sin 2x = -{}^{\sqrt{3}}/_{2}$

(4) $\tan 3x = 1$

(5) $\cos 4x = -1$

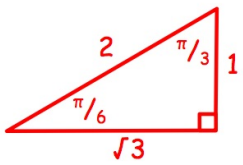
(6) $\tan 3x = {}^{1}/_{\sqrt{3}}$

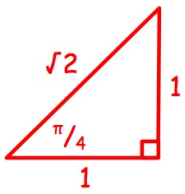
(7) $\sin 3x = -1$

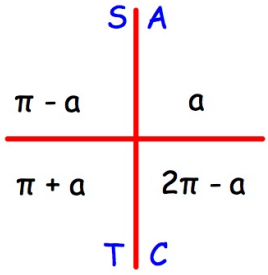
(8) $\cos 2x = -{}^{\sqrt{3}}/_{2}$

(9) $\sin 2x = -{}^{1}/_{\sqrt{2}}$

EXERCISE: TRIG. EQUATIONS







Solve for $0 \le x \le 2\pi$

(1) $\sin x = {}^{1}/_{2}$
${}^{\pi}/_{6}$, ${}^{5\pi}/_{6}$

(2) $\cos x = {}^{1}/_{\sqrt{2}}$
${}^{\pi}/_{4}$, ${}^{7\pi}/_{4}$

(3) $\tan x = {}^{1}/_{\sqrt{3}}$
${}^{\pi}/_{6}$, ${}^{7\pi}/_{6}$

(4) $\cos x = {}^{1}/_{2}$
${}^{\pi}/_{3}$, ${}^{5\pi}/_{3}$

(5) $\sin x = {}^{\sqrt{3}}/_{2}$
${}^{\pi}/_{3}$, ${}^{2\pi}/_{3}$

(6) $\tan x = 1$
${}^{\pi}/_{4}$, ${}^{5\pi}/_{4}$

(7) $\tan x = \sqrt{3}$
${}^{\pi}/_{3}$, ${}^{4\pi}/_{3}$

(8) $\sin x = -{}^{1}/_{2}$
${}^{7\pi}/_{6}$, ${}^{11\pi}/_{6}$

(9) $\sin x = -{}^{\sqrt{3}}/_{2}$
${}^{4\pi}/_{3}$, ${}^{5\pi}/_{3}$

(10) $\tan x = -1$
${}^{3\pi}/_{4}$, ${}^{7\pi}/_{4}$

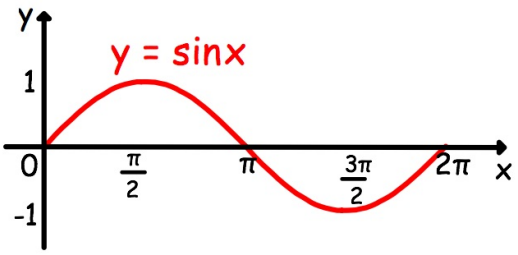
(11) $\cos x = {}^{\sqrt{3}}/_{2}$
${}^{\pi}/_{6}$, ${}^{11\pi}/_{6}$

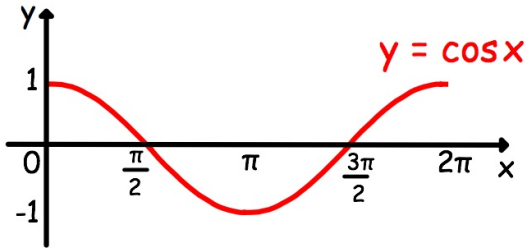
(12) $\tan x = -{}^{1}/_{\sqrt{3}}$
${}^{5\pi}/_{6}$, ${}^{11\pi}/_{6}$

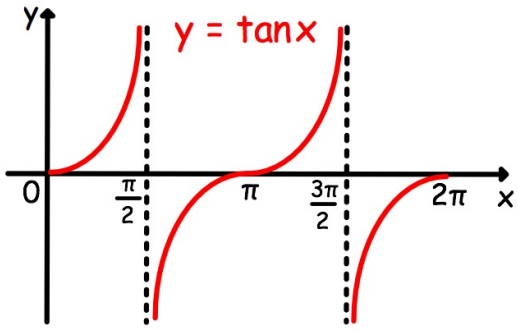
(13) $\sin x = -{}^{1}/_{\sqrt{2}}$
${}^{5\pi}/_{4}$, ${}^{7\pi}/_{4}$

(14) $\cos x = -{}^{1}/_{2}$
${}^{2\pi}/_{3}$, ${}^{4\pi}/_{3}$

(15) $\tan x = -\sqrt{3}$
${}^{2\pi}/_{3}$, ${}^{5\pi}/_{3}$







(16) $\sin x = 1$
${}^{\pi}/_{2}$

(17) $\cos x = -1$
π

(18) $\cos x = 0$
${}^{\pi}/_{2}$, ${}^{3\pi}/_{2}$

(19) $\sin x = -1$
${}^{3\pi}/_{2}$

(20) $\sin x = 0$
0 , π , 2π

(21) $\cos x = 1$
0 , 2π

(22) $\tan x = 0$
0 , ${}^{\pi}/_{2}$, 2π

EXERCISE: TRIG. EQUATIONS

Solve for $0 \le x \le 2\pi$

(1) $\sin x = {}^{1}/_{\sqrt{2}}$ — ${}^{\pi}/_{4}$, ${}^{3\pi}/_{4}$

(2) $\cos x = {}^{\sqrt{3}}/_{2}$ — ${}^{\pi}/_{6}$, ${}^{11\pi}/_{6}$

(3) $\sin x = -{}^{1}/_{2}$ — ${}^{7\pi}/_{6}$, ${}^{11\pi}/_{6}$

Solve for $0 \le x \le \pi$

(4) $\sin 2x = {}^{1}/_{2}$ — ${}^{\pi}/_{12}$, ${}^{5\pi}/_{12}$

(5) $\cos 2x = 1$ — 0 , π

(6) $\tan 2x = -1$ — ${}^{3\pi}/_{8}$, ${}^{7\pi}/_{8}$

Solve for $0 \le x \le {}^{2\pi}/_{3}$

(7) $\cos 3x = {}^{1}/_{2}$ — ${}^{\pi}/_{9}$, ${}^{5\pi}/_{9}$

(8) $\tan 3x = -{}^{1}/_{\sqrt{3}}$ — ${}^{5\pi}/_{18}$, ${}^{11\pi}/_{18}$

(9) $\sin 3x = 0$ — 0 , ${}^{\pi}/_{3}$, ${}^{2\pi}/_{3}$

Solve for $0 \le x \le 2\pi$

(10) $\sin (x - {}^{\pi}/_{9}) = {}^{\sqrt{3}}/_{2}$ — ${}^{4\pi}/_{9}$, ${}^{7\pi}/_{9}$

(11) $\cos (x + {}^{\pi}/_{12}) = -{}^{1}/_{\sqrt{2}}$ — ${}^{2\pi}/_{3}$, ${}^{7\pi}/_{6}$

Solve for $0 \le x \le \pi$

(12) $\cos (2x - {}^{\pi}/_{18}) = 0$ — ${}^{5\pi}/_{18}$, ${}^{7\pi}/_{9}$

(13) $\sin (2x + {}^{\pi}/_{18}) = 1$ — ${}^{2\pi}/_{9}$

Solve correct to 3 significant figures.

Solve for $0 \le x \le 2\pi$

(14) $3 \sin x - 2 = 0$ — 0.730 , 2.41

(15) $5 \cos x + 3 = 2$ — 1.77 , 4.51

Solve for $0 \le x \le \pi$

(16) $4 \sin 2x + 1 = 2$ — 0.126 , 1.44

(17) $6 \tan 2x - 5 = -2$ — 0.232 , 1.80

Solve for $0 \le x \le 2\pi$

(18) $5 \cos (x - {}^{\pi}/_{18}) - 1 = 0$ — 1.54 , 5.09

(19) $3 \sin (x - {}^{\pi}/_{10}) + 2 = 1$ — 3.80 , 6.26

Solve for $0 \le x \le \pi$

(20) $6 \cos (2x - {}^{\pi}/_{20}) + 2 = 3$ — 0.780 , 2.52

(21) $4 \sin (2x + {}^{\pi}/_{9}) - 1 = 2$ — 0.249 , 0.972

EXERCISE: MULTIPLE ANGLES SOLUTIONS

Solve for $0 \le x \le 2\pi$

(1) $\cos 2x = -\frac{1}{2}$

$2x = \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{8\pi}{3}, \frac{10\pi}{3}$

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

(2) $\tan 2x = \sqrt{3}$

$2x = \frac{\pi}{3}, \frac{4\pi}{3}, \frac{7\pi}{3}, \frac{10\pi}{3}$

$x = \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{6}, \frac{5\pi}{3}$

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

$2x = \frac{4\pi}{3}, \frac{5\pi}{3}, \frac{10\pi}{3}, \frac{11\pi}{3}$

$x = \frac{2\pi}{3}, \frac{5\pi}{6}, \frac{5\pi}{3}, \frac{11\pi}{6}$

(4) $\tan 3x = 1$

$3x = \frac{\pi}{4}, \frac{5\pi}{4}, \frac{9\pi}{4}, \frac{13\pi}{4}, \frac{17\pi}{4}, \frac{21\pi}{4}$

$x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{3\pi}{4}, \frac{13\pi}{12}, \frac{17\pi}{12}, \frac{7\pi}{4}$

(5) $\cos 4x = -1$

$4x = \pi, 3\pi, 5\pi, 7\pi$

$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

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

$3x = \frac{\pi}{6}, \frac{7\pi}{6}, \frac{13\pi}{6}, \frac{19\pi}{6}, \frac{25\pi}{6}, \frac{31\pi}{6}$

$x = \frac{\pi}{18}, \frac{7\pi}{18}, \frac{13\pi}{18}, \frac{19\pi}{18}, \frac{25\pi}{18}, \frac{31\pi}{18}$

(7) $\sin 3x = -1$

$3x = \frac{3\pi}{2}, \frac{7\pi}{2}, \frac{11\pi}{2}$

$x = \frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$

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

$2x = \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{17\pi}{6}, \frac{19\pi}{6}$

$x = \frac{5\pi}{12}, \frac{7\pi}{12}, \frac{17\pi}{12}, \frac{19\pi}{12}$

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

$2x = \frac{5\pi}{4}, \frac{7\pi}{4}, \frac{13\pi}{4}, \frac{15\pi}{4}$

$x = \frac{5\pi}{8}, \frac{7\pi}{8}, \frac{13\pi}{8}, \frac{15\pi}{8}$

EXERCISE: MULTIPLE ANGLES SOLUTIONS

Solve for $0 \le x \le 2\pi$

(1) $\cos 2x = -\frac{1}{2}$

$2x = \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{8\pi}{3}, \frac{10\pi}{3}$ (+ $\frac{6\pi}{3}$)

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

(2) $\tan 2x = \sqrt{3}$

$2x = \frac{\pi}{3}, \frac{4\pi}{3}, \frac{7\pi}{3}, \frac{10\pi}{3}$ (+ $\frac{6\pi}{3}$)

$x = \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{6}, \frac{5\pi}{3}$

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

$2x = \frac{4\pi}{3}, \frac{5\pi}{3}, \frac{10\pi}{3}, \frac{11\pi}{3}$ (+ $\frac{6\pi}{3}$)

$x = \frac{2\pi}{3}, \frac{5\pi}{6}, \frac{5\pi}{3}, \frac{11\pi}{6}$

(4) $\tan 3x = 1$

$3x = \frac{\pi}{4}, \frac{5\pi}{4}, \frac{9\pi}{4}, \frac{13\pi}{4}, \frac{17\pi}{4}, \frac{21\pi}{4}$ (+ $\frac{8\pi}{4}$, + $\frac{8\pi}{4}$)

$x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{3\pi}{4}, \frac{13\pi}{12}, \frac{17\pi}{12}, \frac{7\pi}{4}$

(5) $\cos 4x = -1$

$4x = \pi, 3\pi, 5\pi, 7\pi$ (+2π)

$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

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

$3x = \frac{\pi}{6}, \frac{7\pi}{6}, \frac{13\pi}{6}, \frac{19\pi}{6}, \frac{25\pi}{6}, \frac{31\pi}{6}$ (+ $\frac{12\pi}{6}$, + $\frac{12\pi}{6}$)

$x = \frac{\pi}{18}, \frac{7\pi}{18}, \frac{13\pi}{18}, \frac{19\pi}{18}, \frac{25\pi}{18}, \frac{31\pi}{18}$

(7) $\sin 3x = -1$

$3x = \frac{3\pi}{2}, \frac{7\pi}{2}, \frac{11\pi}{2}$ (+ $\frac{4\pi}{2}$, + $\frac{4\pi}{2}$)

$x = \frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$

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

$2x = \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{17\pi}{6}, \frac{19\pi}{6}$ (+ $\frac{12\pi}{6}$)

$x = \frac{5\pi}{12}, \frac{7\pi}{12}, \frac{17\pi}{12}, \frac{19\pi}{12}$

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

$2x = \frac{5\pi}{4}, \frac{7\pi}{4}, \frac{13\pi}{4}, \frac{15\pi}{4}$ (+ $\frac{8\pi}{4}$)

$x = \frac{5\pi}{8}, \frac{7\pi}{8}, \frac{13\pi}{8}, \frac{15\pi}{8}$