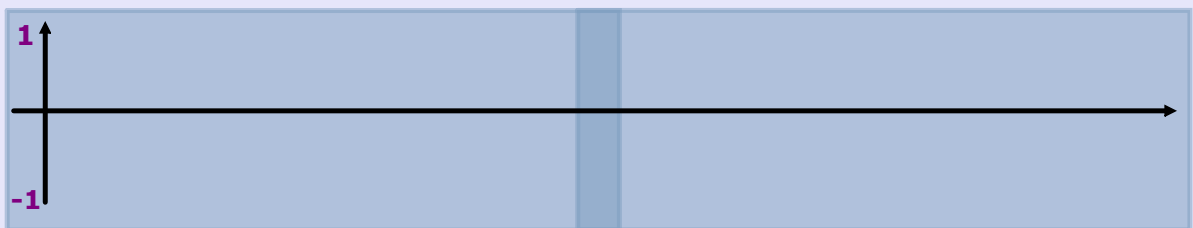


## Working initially in pairs:

Stick two pieces of graph paper (landscape) together, to make one long piece.



Through the middle draw a horizontal line (x axis).  
Mark every 2cm as  $40^\circ$ .

Down the left hand side draw the y axis.

Sine and cosine: mark to  $\pm 1$  (choose your own scale).

Tangent: mark 2cm as 2 units

Using a calculator take a reading every  $10^\circ$ ...eg  $\sin 10^\circ$ ,  $\sin 20^\circ$ , etc.

Mark as accurately as you can.

When you are at the end of your x axis very carefully join the points with a freehand curve.

Using your neighbours, results to help, sketch all three graphs in your book.

Title: Graphs of trig functions

## Using Trig Graphs

Working in groups so that you have the 3 graphs to share, work out through the following questions.

*Write the question and answer in your book.*

1. Find values of  $x$ , where  $x$  is between  $0$  and  $1000^\circ$ , such that

- a)  $\sin x = 0.5$
- b)  $\tan x = 1$
- c)  $\cos x = -0.5$
- d)  $\sin x = -0.3$
- e)  $\tan x = 25$
- f)  $\cos x = 1.5$

2. Find the values of  $y$  for which

- a)  $\sin y = 1$
- b)  $\sin y = -1$
- c)  $\cos y = 1$
- d)  $\cos y = -1$
- e)  $\sin y = 0$
- f)  $\cos y = 0$
- g)  $\tan y = 0$

3. Find possible values for  $z$  where  $0^\circ$  if

- a)  $2 \sin z = 1$
- b)  $5 \cos z = 4$
- c)  $6 \tan z = 100$
- d)  $\sin z + 1 = 1$
- e)  $\sin z + 2 = 1.5$
- f)  $\tan z = 3$

Text book page 354 qu A13 - A17; page 356 B7; page 359 C4

Use your graphs/calculator to answer  
page 353 A4-A12

Sine graph

Cosine graph

Use your graphs/calculator to answer  
page 356 B1-B14

Use your graphs/calculator to answer  
page 359 C1-C7

tangent graph

Sketch the three trig functions

Find values for  $x$  such that  $0^\circ \leq x \leq 360^\circ$

if

$$\sin x = 0.5$$

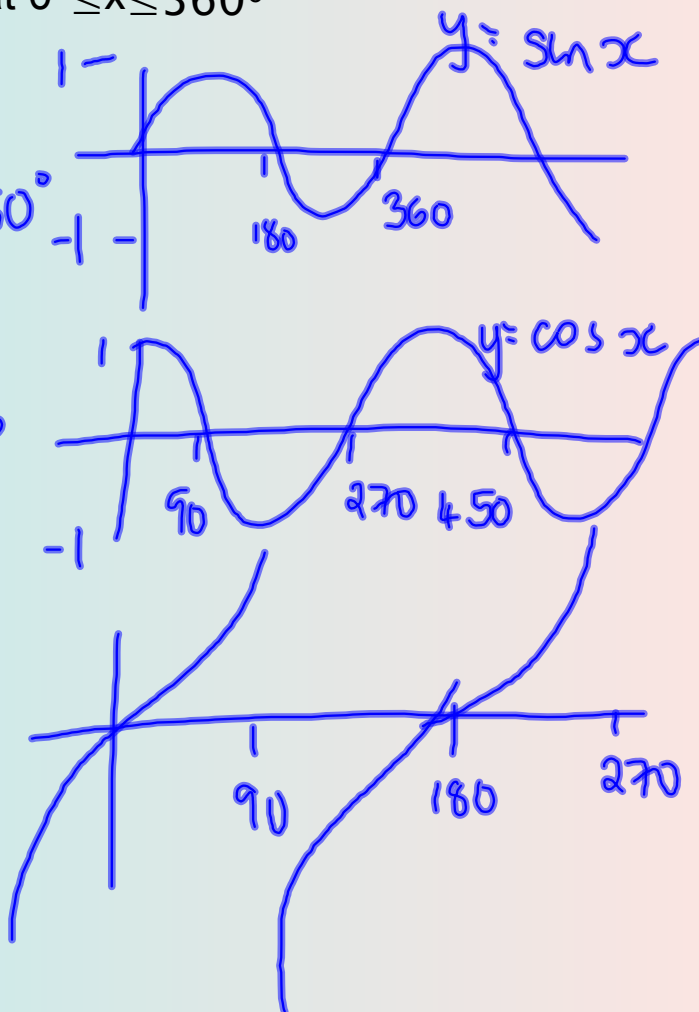
$$x = 30^\circ, 150^\circ$$

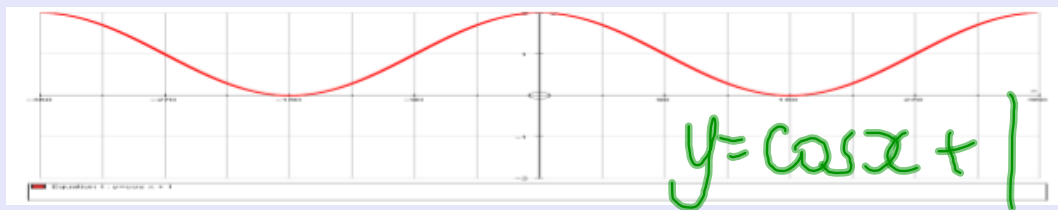
$$\cos x = 0.2$$

$$x = 78.5^\circ, 281.5^\circ$$

$$\tan x = 7$$

$$x = 82^\circ, 262^\circ$$

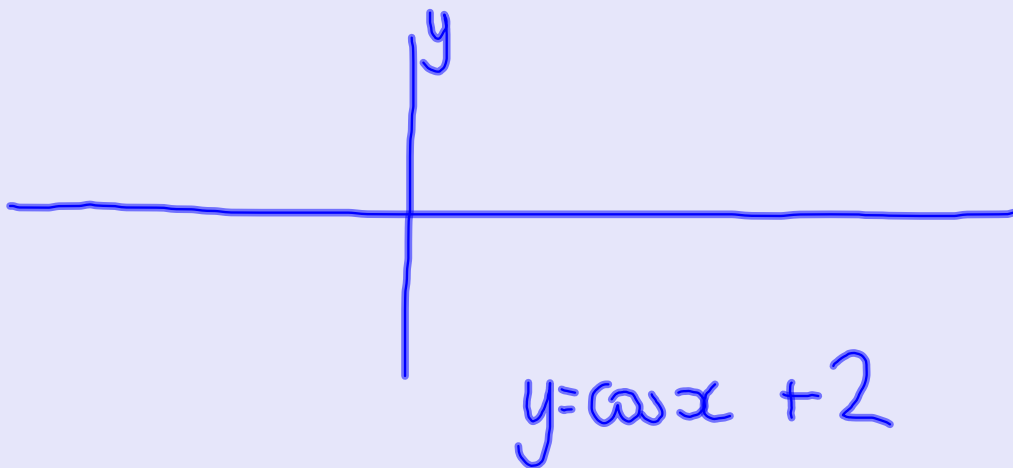
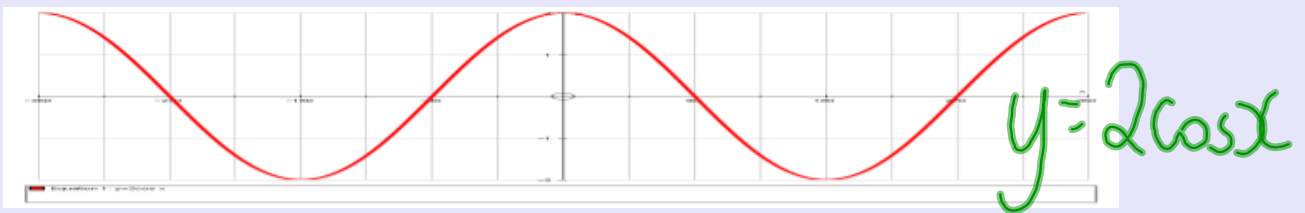




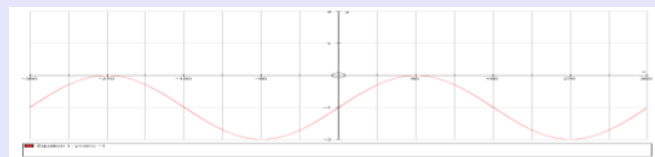
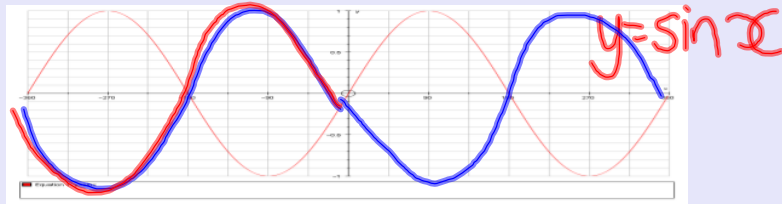
$$y = 2\cos x$$

$$y = \cos x + 1$$

$$y = \cos x$$



# Transformations of trig graphs



$y = \sin x - 1$

$y = \sin(-x)$

$y = -\sin x$



**Draw graphs of**

**$y = \cos x$**

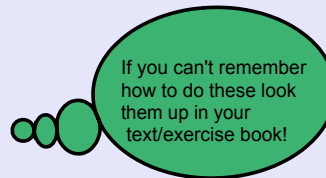
**$y = \cos x + 3$**

**$y = 2\cos x$**

**$y = \cos 2x$**

**$y = \cos(-x)$**

**$y = -\cos x$**



**Extension:**

1. How can you transform  $y = \cos x$  so that it looks like  $y = \sin x$ ?

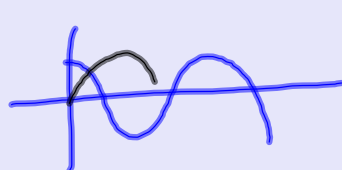
Describe the transformation in words and with a suitable equation.

2. Draw the following transformations of  $y = \sin x$ :

a)  $y = \sin 2x + 5$

b)  $y = 3\sin 3x$

c)  $y = \sin(-0.5x)$



$y = \cos(x - 90^\circ) = \sin x$

Suppose we wanted to translate  $\sin x$   $60^\circ$  to the right. How would we express that?

Express the following transformations as an equation:

			maxm	minm
$y = \sin x$	translation $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$	$y = \sin x + 3$	4	2
$y = \cos x$	Stretch parallel to the x axis sf 2	$y = \cos\left(\frac{1}{2}x\right)$	1	-1
$y = \sin x$	translation $\begin{pmatrix} -45 \\ 0 \end{pmatrix}$	$y = \sin(x + 45)$	1	-1
$y = \sin x$	stretch parallel to the y axis sf 3	$y = 3\sin x$	3	-3
$y = \sin x$	reflection in the x axis	$y = -\sin x$	1	-1

**Describe the following transformations of  $y = \cos x$ :**

$y = \cos(-x)$

$y = \cos 3x$

$y = 2\cos x + 5$

$y = -\cos x$

$y = \cos(x - 60)$

Page 503 Edexcel text book  
qu 1-3, 6

Extension: Solving trig equations page 288, 289 qu 1-3, p289 Ex13J