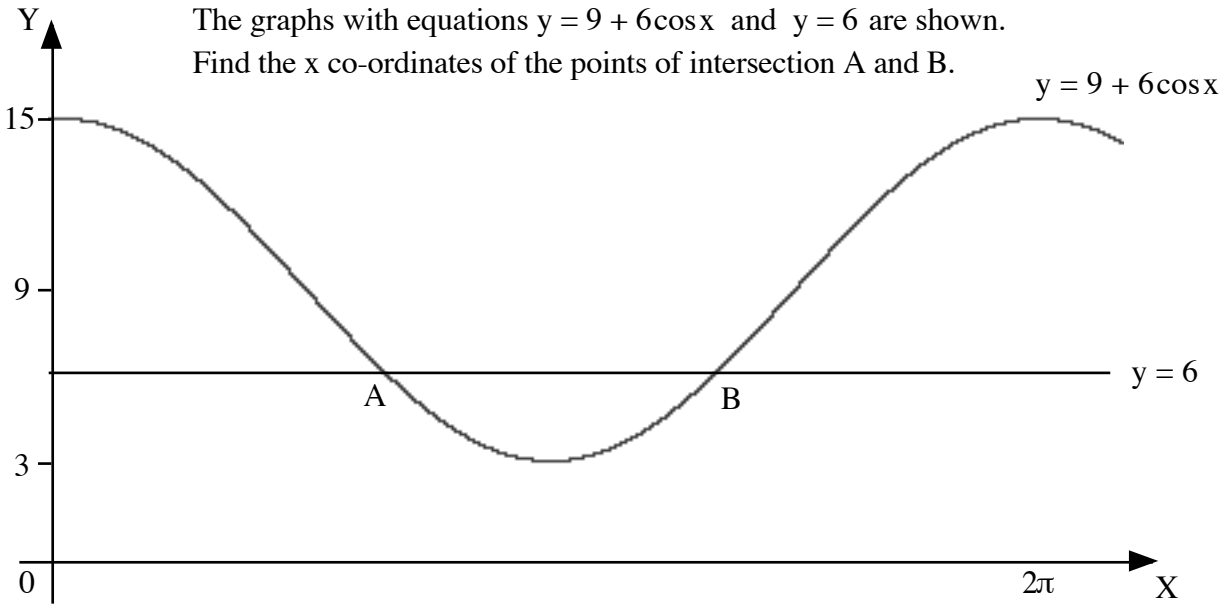
TRIG. GRAPHS: EQUATIONS

Non-calcualator: exact values and multiples of π

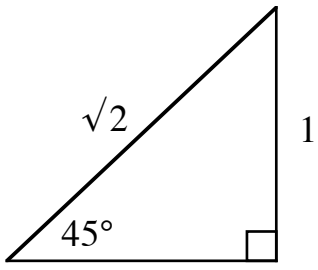


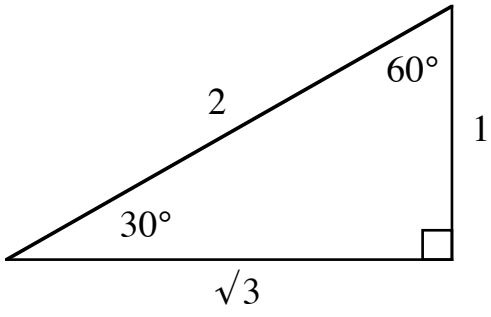
The graphs with equations $y = 9 + 6\cos x$ and $y = 6$ are shown.
Find the x co-ordinates of the points of intersection A and B.

$$9 + 6\cos x = 6$$
$$6\cos x = -3$$
$$\cos x = -\tfrac{1}{2}$$
$$x = \tfrac{2\pi}{3} \text{ or } x = \tfrac{4\pi}{3}$$

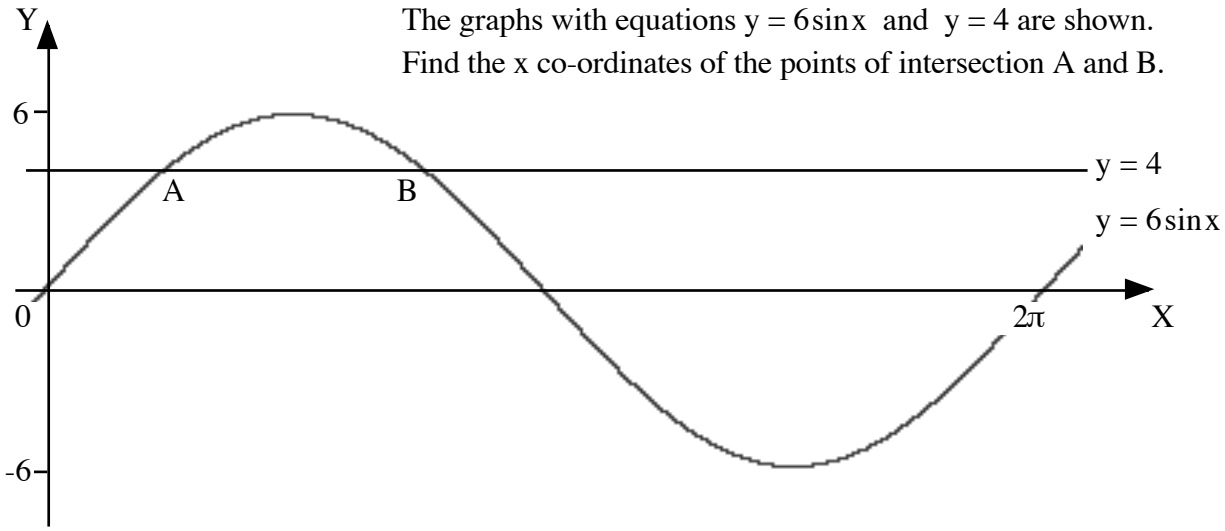
A, S, T, C is where functions are positive:

S	A
cos -	cos +
$\pi - a = \tfrac{2\pi}{3}$ (120°)	$a = \cos^{-1}\tfrac{1}{2} = \tfrac{\pi}{3}$ (60°)
$\pi + a = \tfrac{4\pi}{3}$ (240°)	$2\pi - a = \tfrac{5\pi}{3}$ (300°)
cos -	cos +
T	C





Calcualator: set to radians



The graphs with equations $y = 6\sin x$ and $y = 4$ are shown.
Find the x co-ordinates of the points of intersection A and B.

$6 \sin x = 4$

$\sin x = 2/3$

$x = 0{\cdot}72972...$ or $x = \pi - 0{\cdot}72972...$

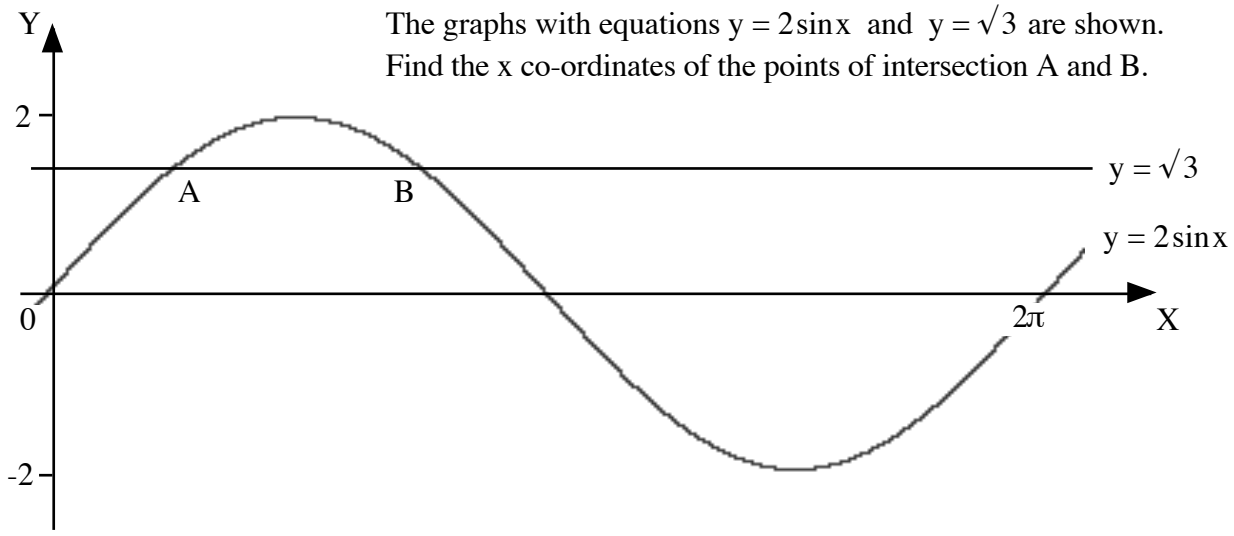
$x = 0{\cdot}730$ or $x = 2{\cdot}41$

A, S, T, C is where functions are positive:

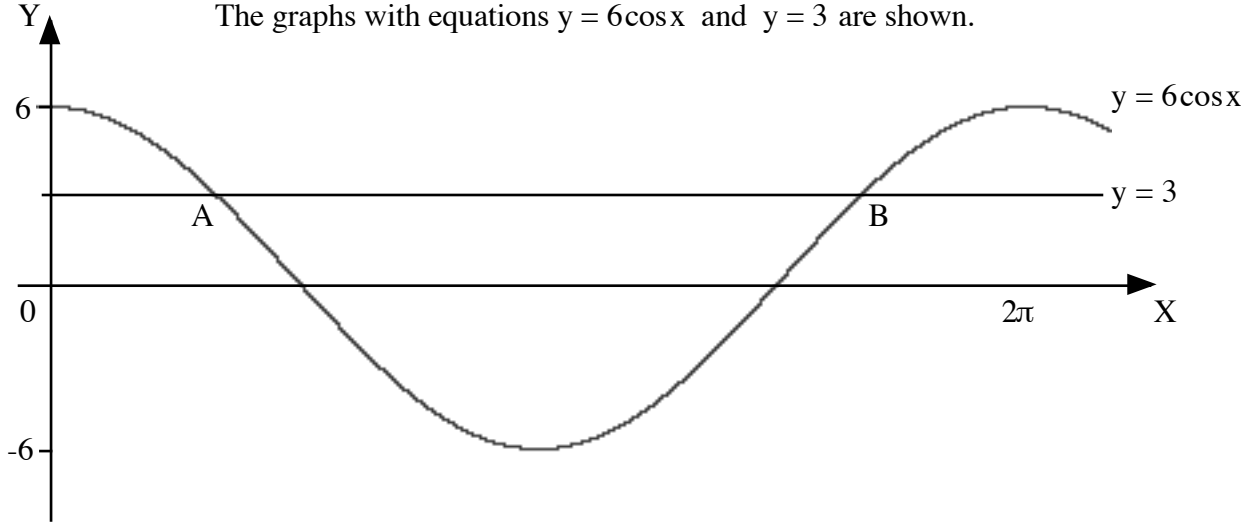
S sin +	A sin +
$\pi - a = \pi - 0{\cdot}72972...$	$a = \sin^{-1} 2/3 = 0{\cdot}72972...$
$\pi + a = \pi + 0{\cdot}72972...$	$2\pi - a = 2\pi - 0{\cdot}72972...$
sin - T	C sin -

For questions 1 to 9 do **not** use a calculator and give your answers as multiples of π.

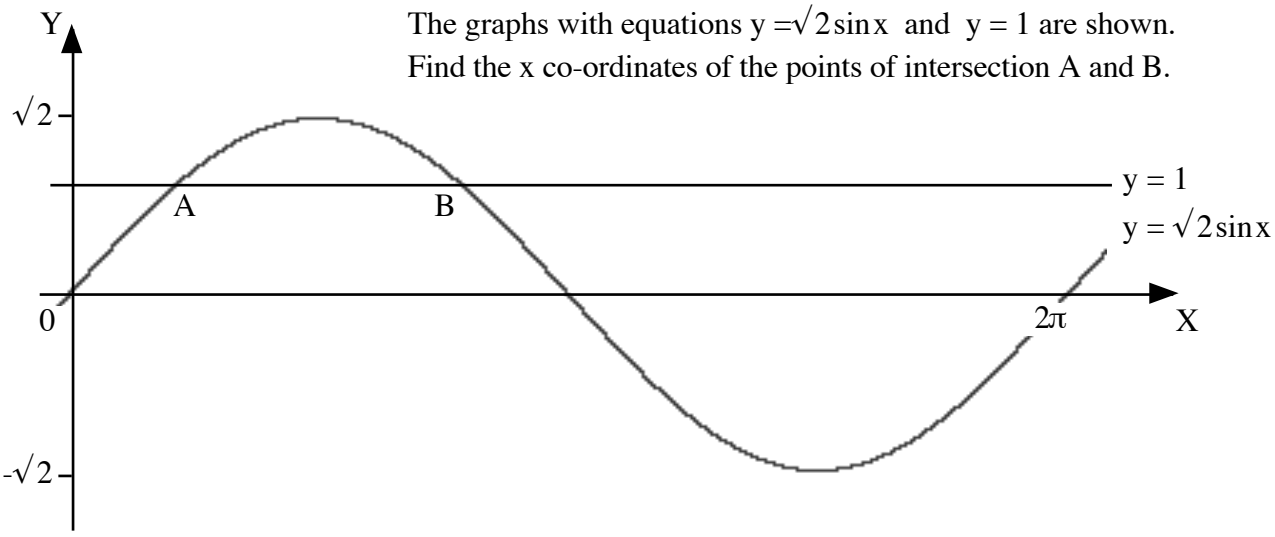
1. The graphs with equations $y = 2\sin x$ and $y = \sqrt{3}$ are shown.
Find the x co-ordinates of the points of intersection A and B.



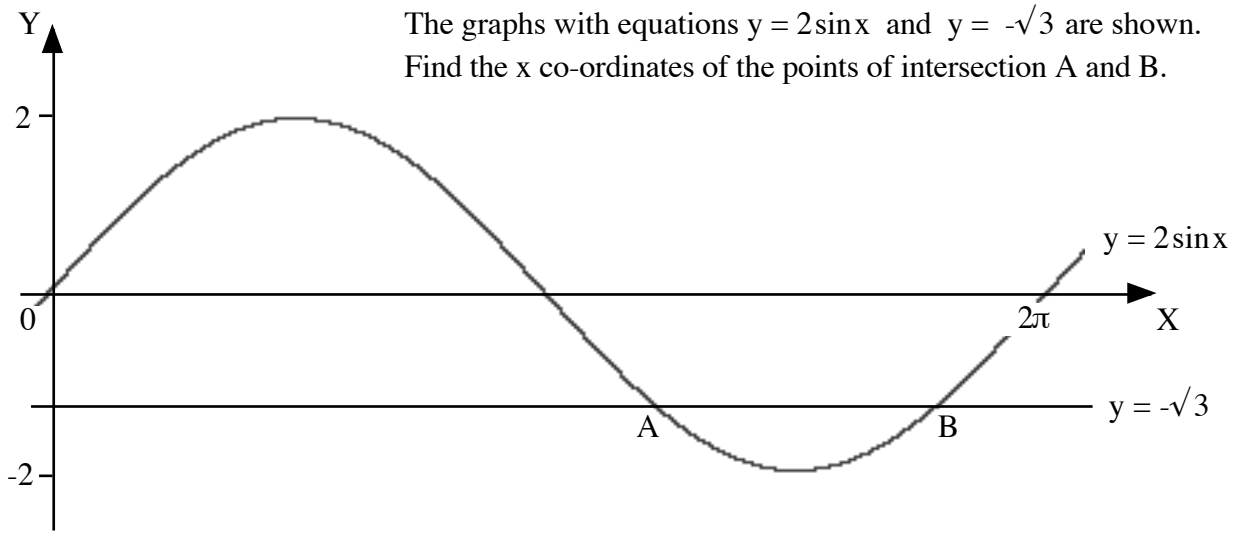
2. The graphs with equations $y = 6\cos x$ and $y = 3$ are shown.



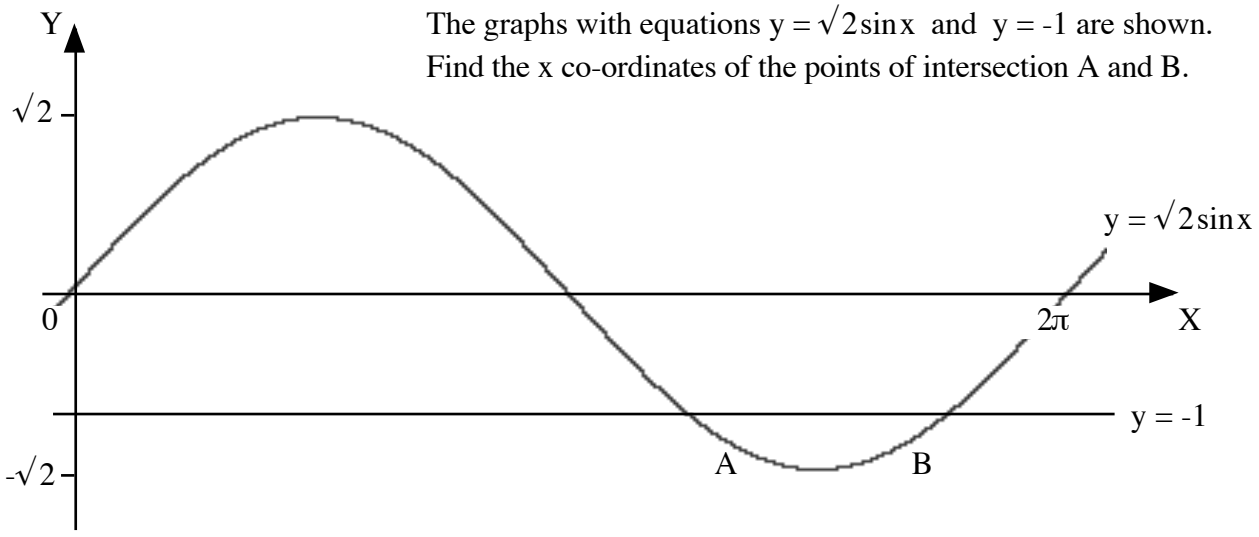
3. The graphs with equations $y = \sqrt{2}\sin x$ and $y = 1$ are shown.
Find the x co-ordinates of the points of intersection A and B.



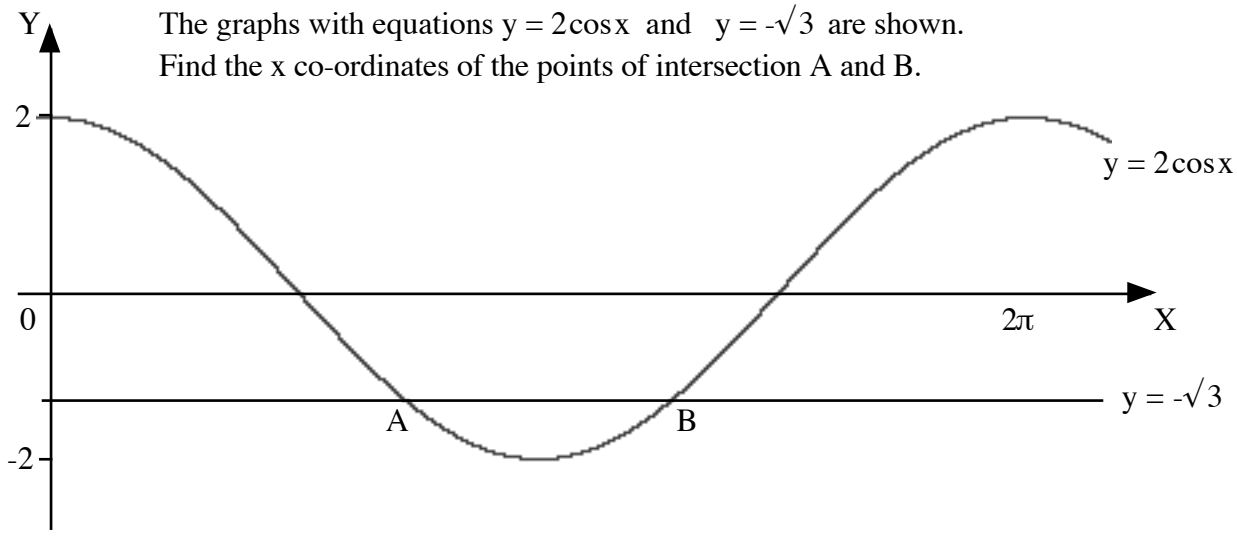
4. The graphs with equations $y = 2\sin x$ and $y = -\sqrt{3}$ are shown.
Find the x co-ordinates of the points of intersection A and B.



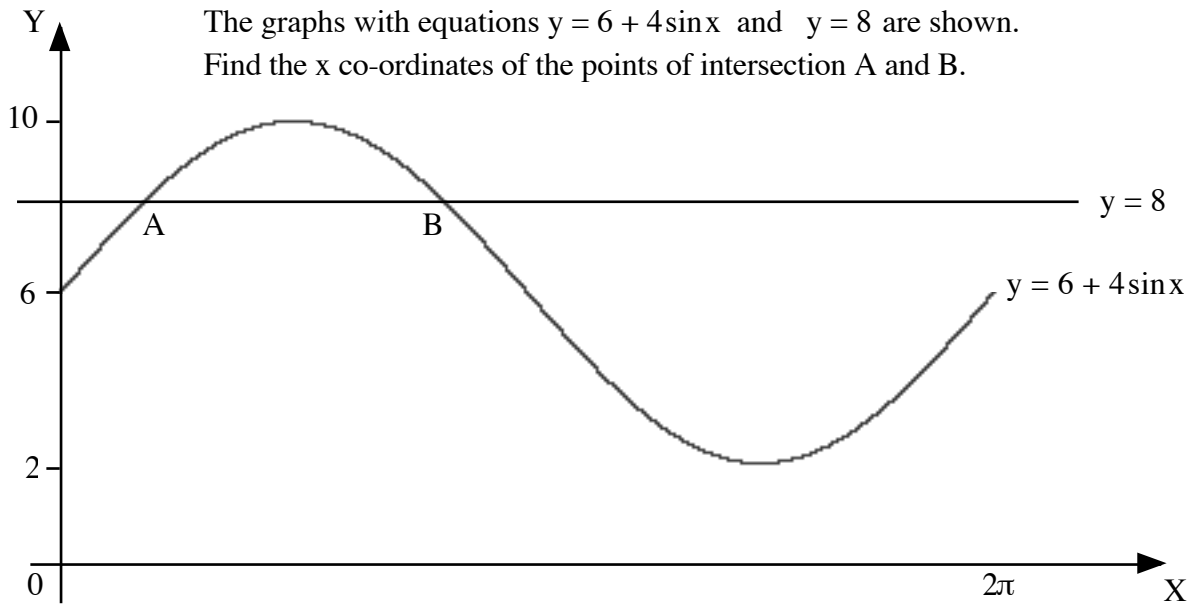
5. The graphs with equations $y = \sqrt{2}\sin x$ and $y = -1$ are shown.
Find the x co-ordinates of the points of intersection A and B.



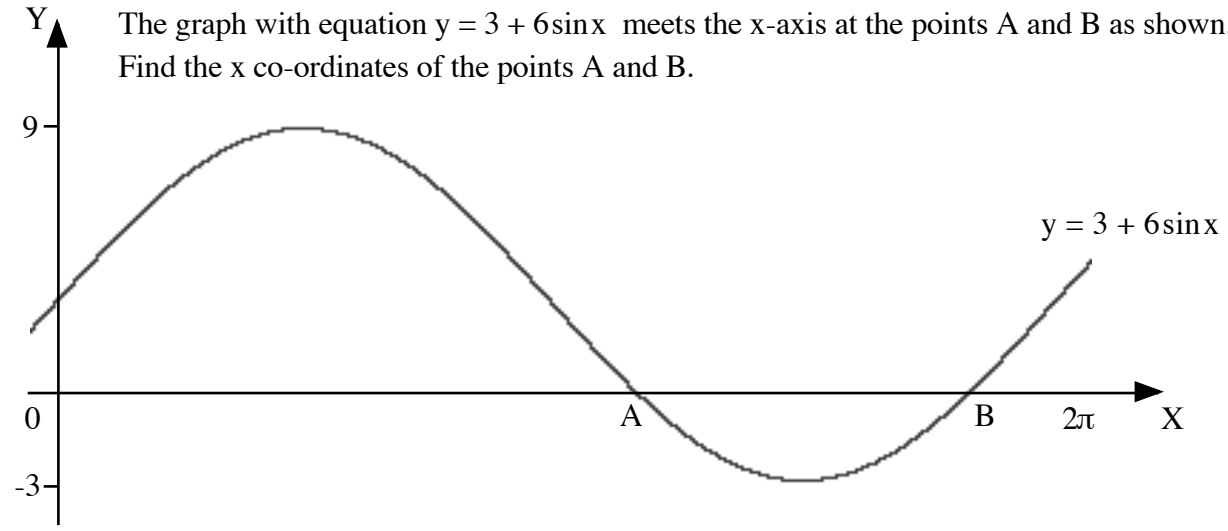
6. The graphs with equations $y = 2\cos x$ and $y = -\sqrt{3}$ are shown.
Find the x co-ordinates of the points of intersection A and B.



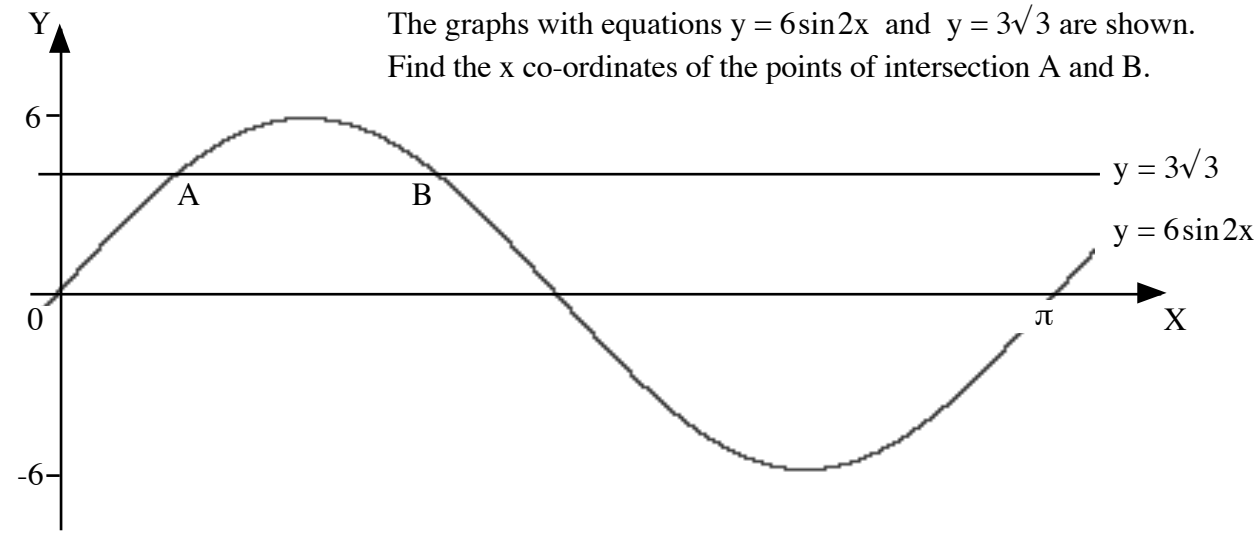
7. The graphs with equations $y = 6 + 4\sin x$ and $y = 8$ are shown.
Find the x co-ordinates of the points of intersection A and B.



8. The graph with equation $y = 3 + 6\sin x$ meets the x-axis at the points A and B as shown.
Find the x co-ordinates of the points A and B.

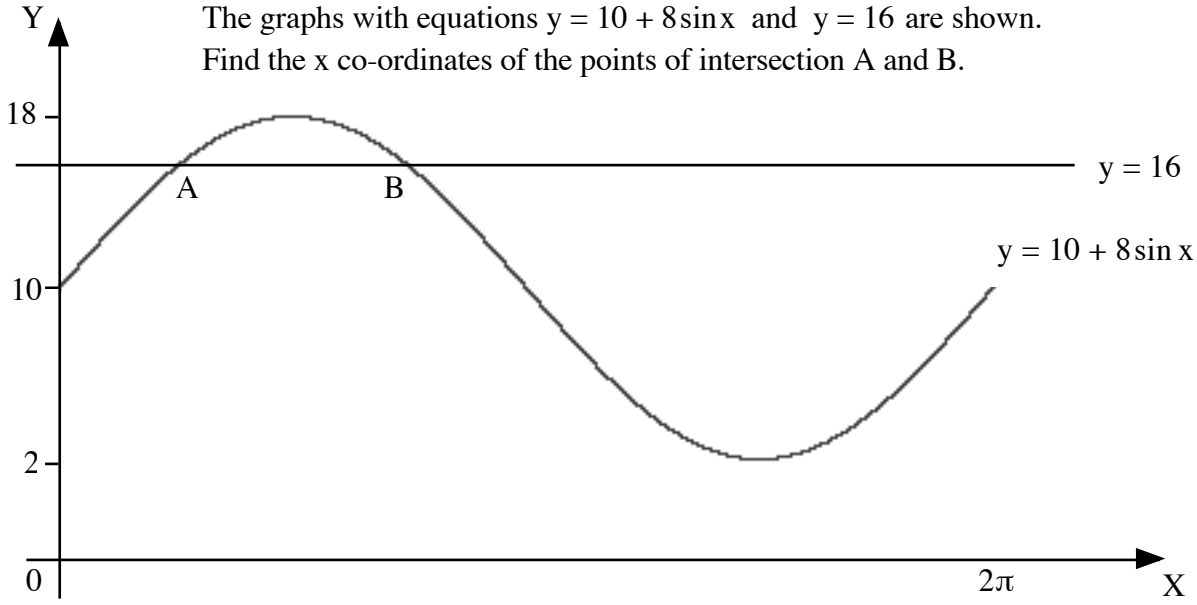


9. The graphs with equations $y = 6\sin 2x$ and $y = 3\sqrt{3}$ are shown.
Find the x co-ordinates of the points of intersection A and B.

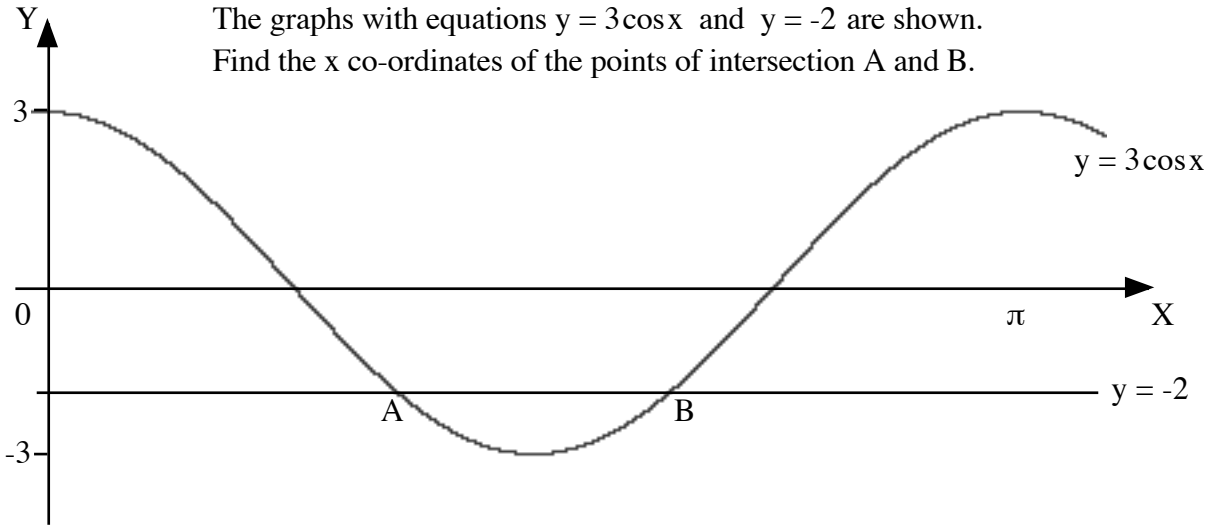


For questions 10 to 12 **use a calculator**. Set your calculator to radians.
Give your answers correct to 3 significant figures.

10. The graphs with equations $y = 10 + 8\sin x$ and $y = 16$ are shown.
Find the x co-ordinates of the points of intersection A and B.



11. The graphs with equations $y = 3\cos x$ and $y = -2$ are shown.
Find the x co-ordinates of the points of intersection A and B.



12. The graph with equation $y = 3 + 5\sin x$ meets the x-axis at the points A and B as shown.
Find the x co-ordinates of the points A and B.