



# Trigonometric Equations and Functions



## 1 Trigonometric Equations

1. Solve each of the following trigonometric equations for  $\theta$ , where  $0^\circ \leq \theta \leq 360^\circ$  :

i.  $\sin \theta = 0.5$

ii.  $\cos \theta = \frac{\sqrt{3}}{2}$

iii.  $\tan \theta = 1$

iv.  $\cos \theta = -\frac{\sqrt{3}}{2}$

v.  $\tan \theta = -\sqrt{3}$

vi.  $2 \sin \theta = \sqrt{3}$

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

viii.  $2 \sin^2 \theta = 1$

ix.  $4 \cos^2 \theta = 3$

2. Solve each of the following trigonometric equations for  $x$ , where  $0^\circ \leq x \leq 360^\circ$  :

i.  $\sin 2x = \frac{1}{2}$

ii.  $\tan 3x = -\frac{1}{\sqrt{3}}$

iii.  $\cos 2x = \frac{1}{\sqrt{2}}$

iv.  $\sin 2x = -\frac{1}{\sqrt{2}}$

v.  $\sin 3x = 0$

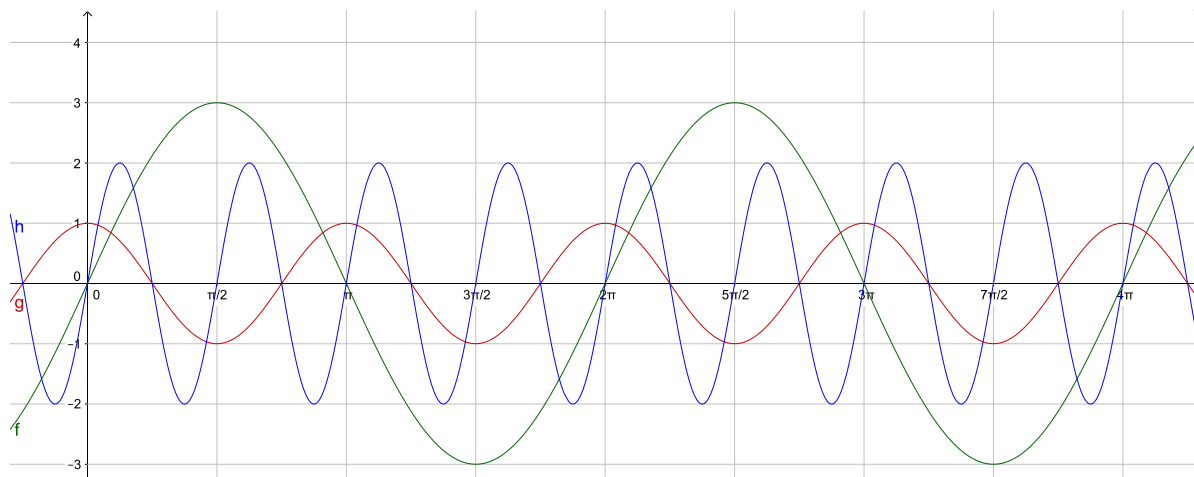
vi.  $\cos 4x + 1 = 0$



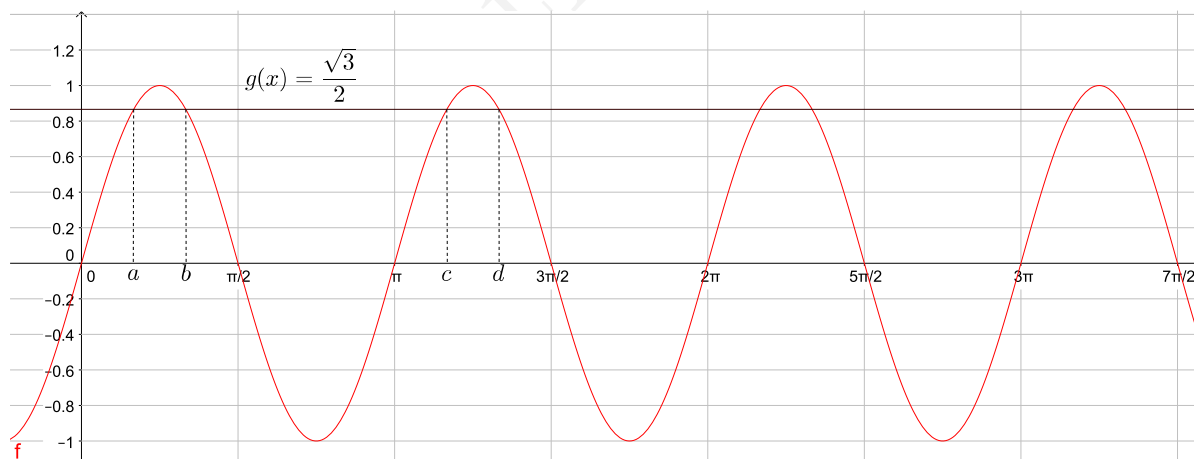


## 2 Trigonometric Functions

1. (a) What is the range and the period of the function  $f(x) = 3 \sin x$ ?
- (b) What is the period and the range of the function  $g(x) = \cos(2x)$ ?
- (c) Label  $f(x)$  and  $g(x)$  on the graph below.
- (d)  $h(x)$  is also on the graph below. What is the function  $h(x)$ ?

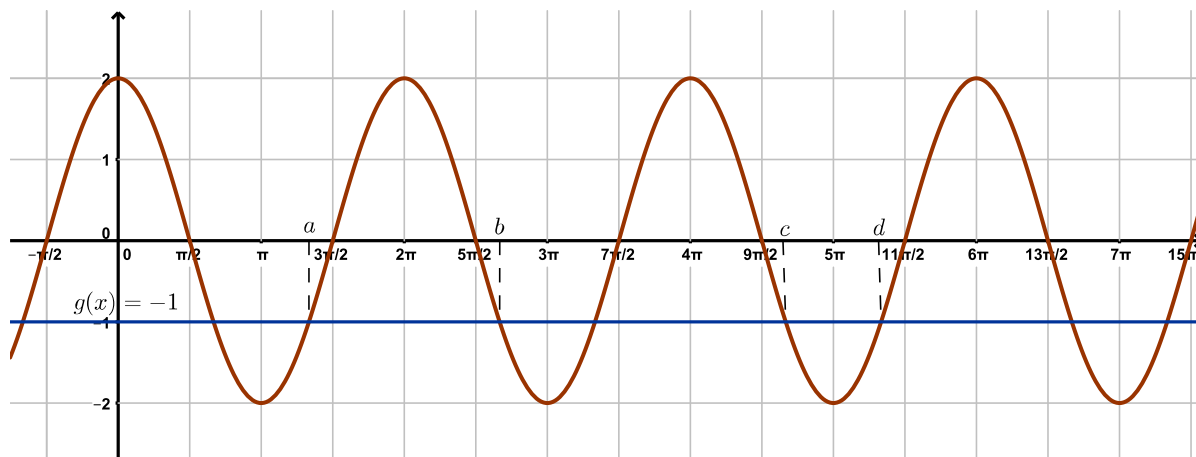


2. (a) Identify  $f(x)$ , the trigonometric function in the graph below.
- (b)  $g(x) = \frac{\sqrt{3}}{2}$ . By letting  $f(x) = g(x)$  and solving the resulting equation, find the values of  $a, b, c$  and  $d$  on the graph below.





3. (a) Identify  $f(x)$ , the trigonometric function in the diagram below.
- (b)  $g(x) = -1$ . By letting  $f(x) = g(x)$  and solving the resulting equation, find the values of  $a, b, c$  and  $d$ .



4. (i) Name the following function.
- (ii) Based on your knowledge of the definition of this function, can you make a comment as to what is happening at each multiple of  $\pi/2$ .
- (iii) What will the value of the function be at (a)  $x = 3\pi$ , (b)  $x = 5\pi/2$ ?

