

St Peter the Apostle High School

Maths Department



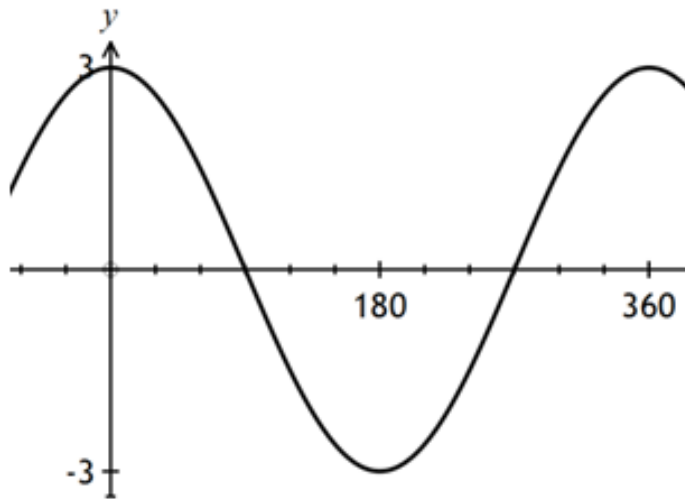
Higher Practice Questions

4. Trigonometry

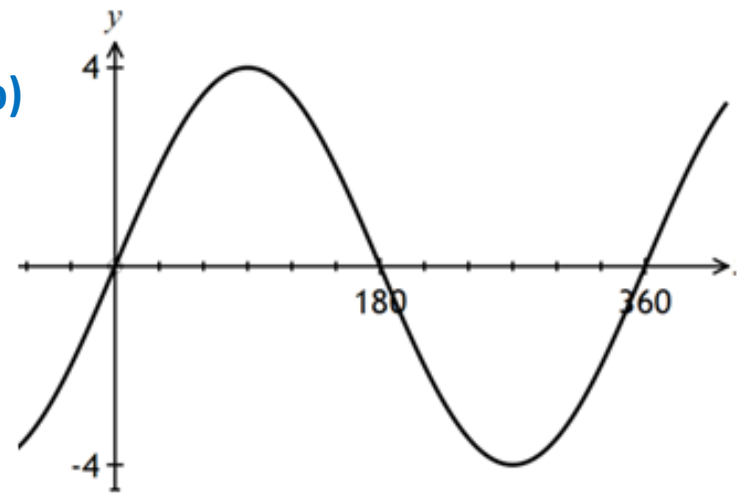
1

Write down the equation of each of the graphs below.

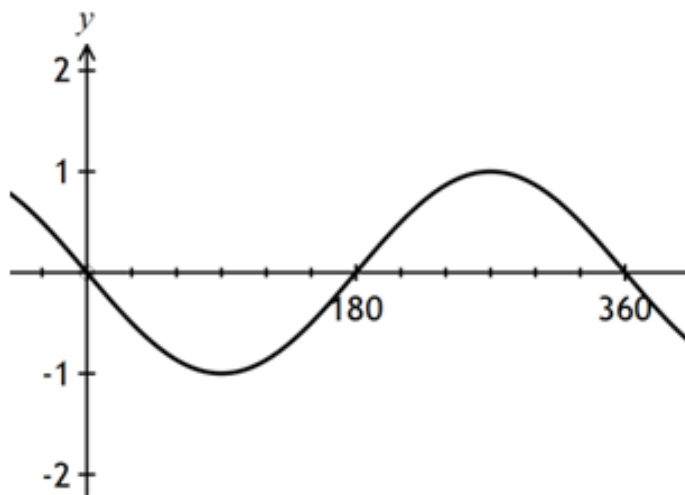
(a)



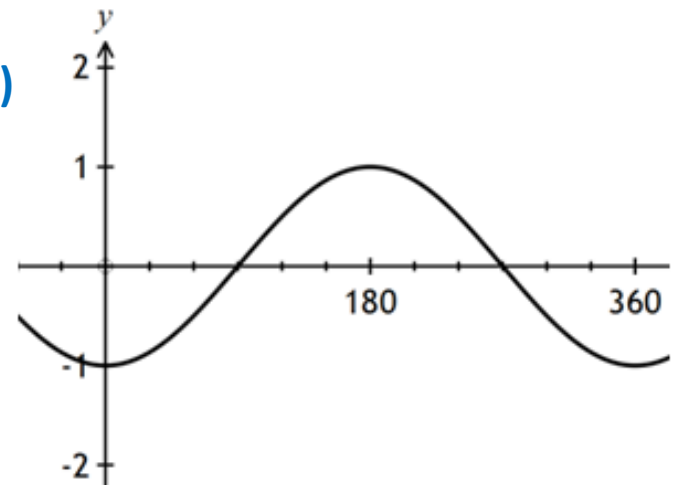
(b)



(c)

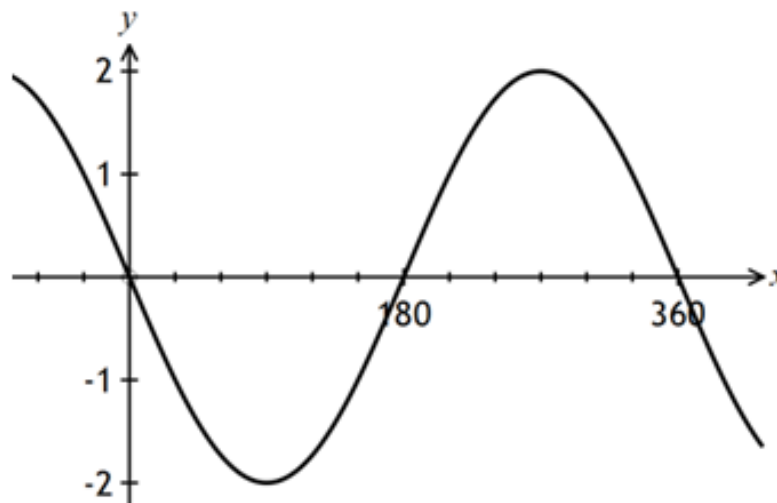


(d)

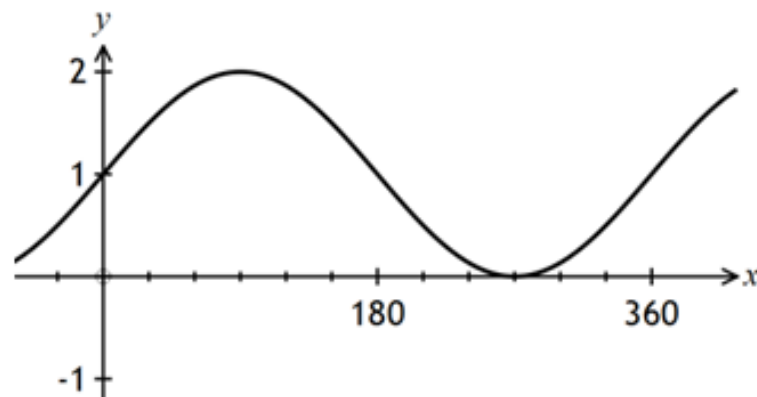


2 Write down the equation of each of the graphs below.

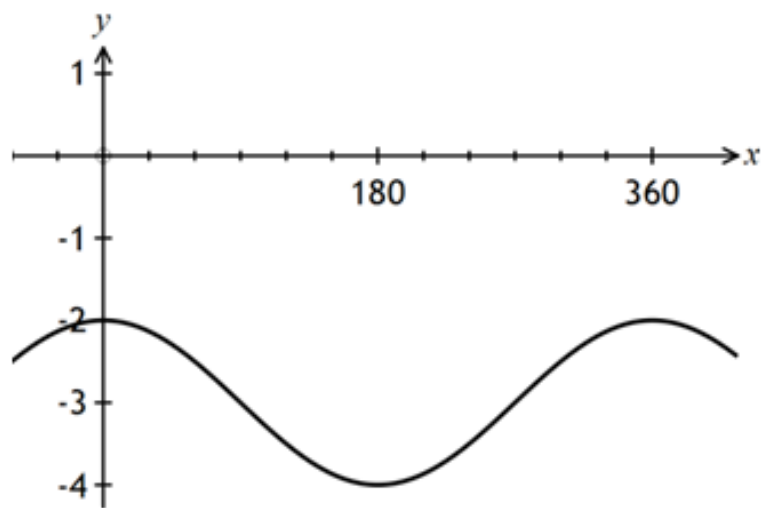
(a)



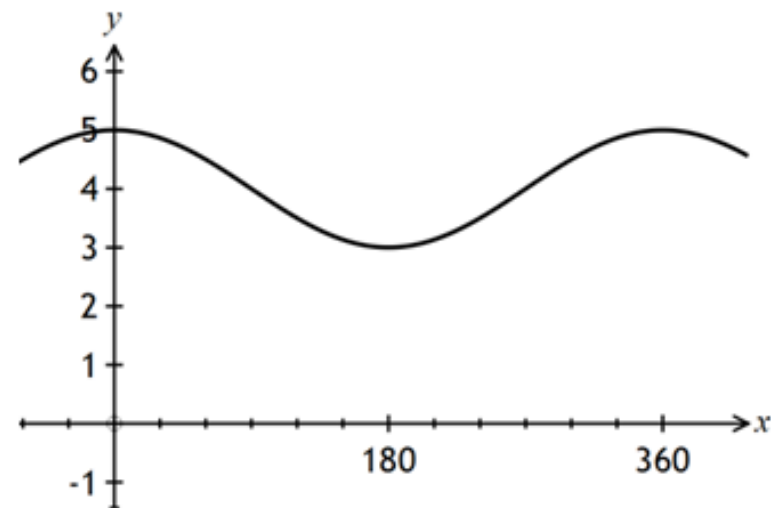
(b)



(c)

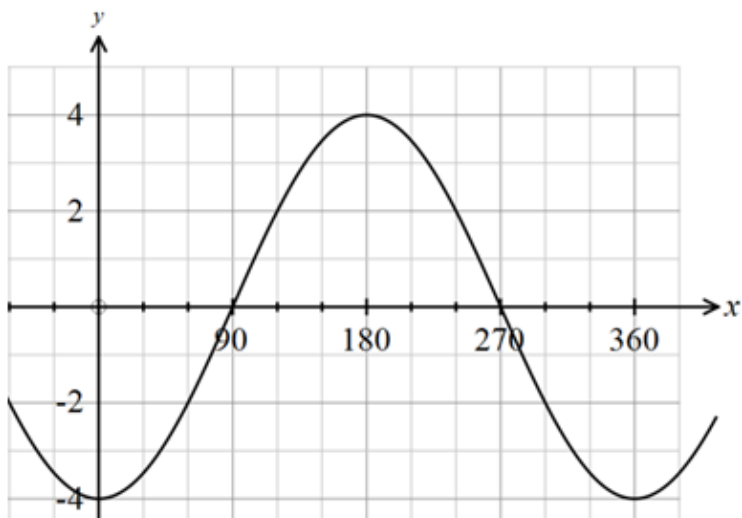


(d)



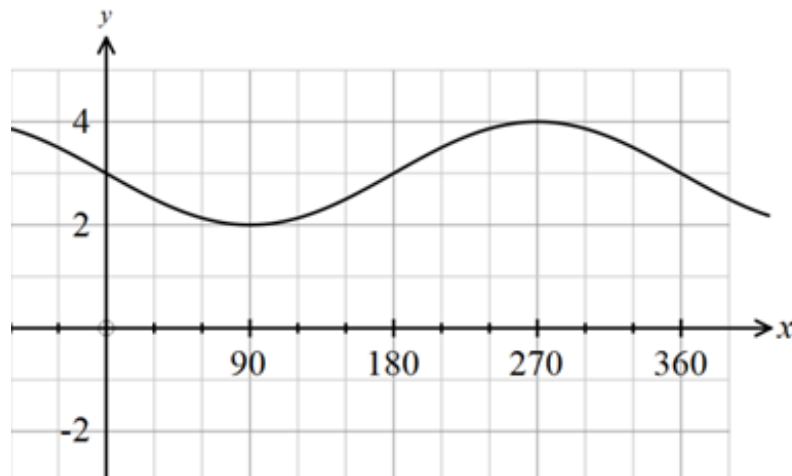
3 Write down the equation of each of the graphs below.

(a)



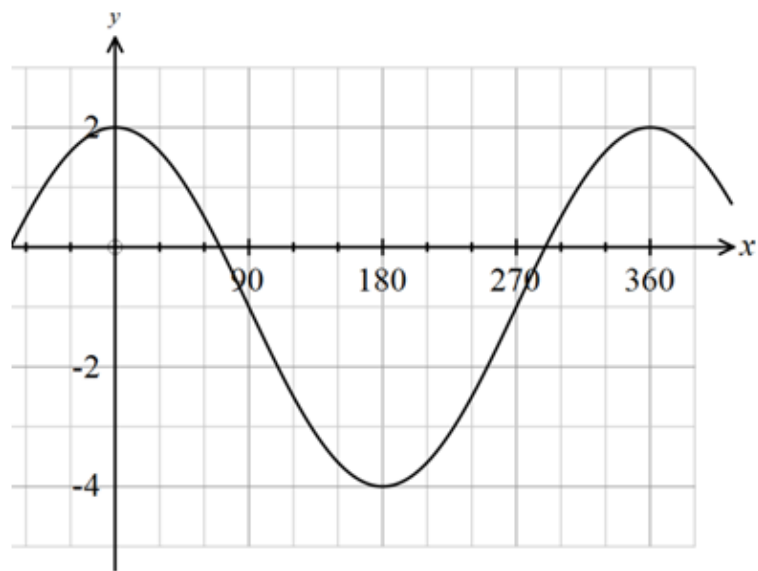
(c)

(b)

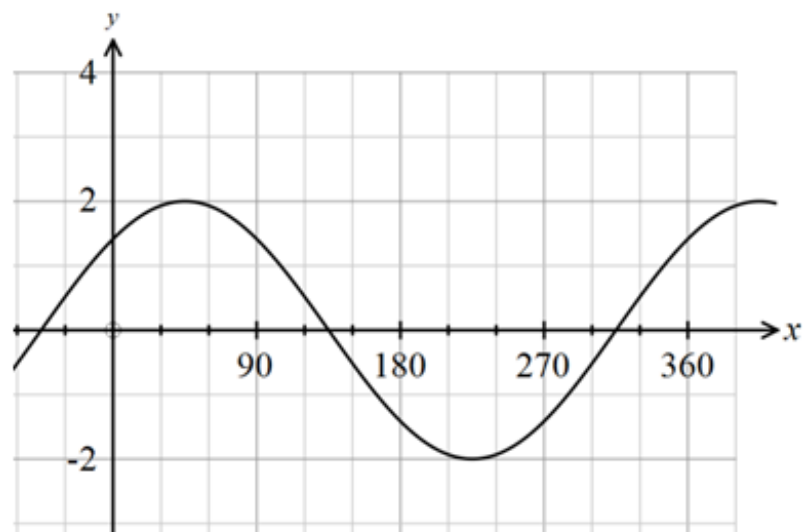


(d)

(c)



(d)



4

Sketch each graph showing clearly the coordinates of the maximum and minimum values and where each graph cuts the axes.

(a) $y = 3 \cos x$ for $0 \leq x \leq 360$

(b) $y = \sin x + 1$ for $0 \leq x \leq 360$

(c) $y = \tan(x - 45)$ for $0 \leq x \leq 360$

(d) $y = -3 \sin x$ for $0 \leq x \leq 2\pi$

(e) $y = 2 \cos x - 3$ for $0 \leq x \leq 360$

(f) $y = 3 \cos 4x$ for $0 \leq x \leq 360$

(g) $y = -\sin(x - 30)$ for $0 \leq x \leq 360$

(h) $y = 2 - \sin x$ for $0 \leq x \leq 2\pi$

5

Convert the following angles from degrees to radians, giving your answer as an exact value.

(a) 30°

(b) 45°

(c) 60°

(d) 90°

(e) 180°

(f) 360°

(g) 120°

(h) 135°

(i) 150°

(j) 210°

(k) 225°

(l) 240°

(m) 270°

(n) 300°

(o) 315°

(p) 330°

(q) 540°

(r) 720°

6

Convert the following angles from degrees to radians, giving your answer to 3 significant figures.

(a) 37°

(b) 142°

(c) 226°

(d) 281°

(e) 307°

(f) 453°

7

Convert the following angles from degrees to radians, giving your answer as an exact value.

(a) π radians

(b) 2π radians

(c) 3π radians

(d) $\frac{\pi}{2}$ radians

(e) $\frac{3\pi}{2}$ radians

(f) $\frac{5\pi}{2}$ radians

(g) $\frac{\pi}{3}$ radians

(h) $\frac{2\pi}{3}$ radians

(i) $\frac{4\pi}{3}$ radians

(j) $\frac{5\pi}{3}$ radians

(k) $\frac{7\pi}{3}$ radians

(l) $\frac{\pi}{4}$ radians

(m) $\frac{3\pi}{4}$ radians

(n) $\frac{5\pi}{4}$ radians

(o) $\frac{7\pi}{4}$ radians

(p) $\frac{\pi}{6}$ radians

(q) $\frac{5\pi}{6}$ radians

(r) $\frac{7\pi}{6}$ radians

(s) $\frac{11\pi}{6}$ radians

(t) $\frac{\pi}{12}$ radians

(u) $\frac{5\pi}{12}$ radians

8

Convert the following angles from radians to degrees, giving your answer to 3 significant figures.

(a) 1 radian

(b) 2 radians

(c) 3 radians

(d) 4 radians

(e) 1.4 radians

(f) 2.7 radians

9

Write down the exact value of

(a) $\sin 30^\circ$

(b) $\cos 60^\circ$

(c) $\tan 45^\circ$

(d) $\sin 120^\circ$

(e) $\cos 150^\circ$

(f) $\tan 135^\circ$

(g) $\sin 90^\circ$

(h) $\cos 180^\circ$

(i) $\tan 270^\circ$

(j) $\sin 210^\circ$

(k) $\cos 225^\circ$

(l) $\tan 240^\circ$

(m) $\sin 300^\circ$

(n) $\cos 330^\circ$

(o) $\tan 315^\circ$

(p) $\sin 540^\circ$

(q) $\cos 405^\circ$

(r) $\tan 390^\circ$

10

Write down the exact value of

(a) $\sin \frac{\pi}{6}$

(b) $\cos \frac{\pi}{4}$

(c) $\tan \frac{\pi}{3}$

(d) $\sin \pi$

(e) $\cos 2\pi$

(f) $\tan \frac{3\pi}{2}$

(g) $\sin \frac{5\pi}{6}$

(h) $\cos \frac{3\pi}{4}$

(i) $\tan \frac{2\pi}{3}$

(j) $\sin \frac{7\pi}{6}$

(k) $\cos \frac{5\pi}{4}$

(l) $\tan \frac{4\pi}{3}$

(m) $\sin \frac{11\pi}{6}$

(n) $\cos \frac{7\pi}{4}$

(o) $\tan \frac{5\pi}{3}$

(p) $\sin \frac{13\pi}{6}$

(q) $\cos \frac{10\pi}{3}$

(r) $\tan \frac{11\pi}{4}$

11

Find the exact value of the following:

(a) $\sin \frac{\pi}{6} + \cos \frac{\pi}{6}$

(b) $2 \sin \pi - 2 \cos \pi$

(c) $\cos \frac{\pi}{4} - \sin \frac{\pi}{4}$

(d) $\sin^2 \frac{\pi}{3} + \cos^2 \frac{\pi}{3}$

(e) $\tan^2 \frac{\pi}{6} + \tan^2 \frac{\pi}{3}$

(f) $\cos^2 \frac{5\pi}{4}$

(g) $\sin^2 \frac{4\pi}{3}$

(h) $2 \sin \frac{11\pi}{6} \cos \frac{5\pi}{6}$

12

Solve the equations:

(a) $5 \tan x - 6 = 2$ for $0 \leq x \leq 360$

(b) $4 \sin x - 2 = -3$ for $0 \leq x \leq 2\pi$

(c) $3 \cos 2x + 2 = 0$ for $0 \leq x \leq 360$

(d) $4 \sin 3x + 1 = -2$ for $0 \leq x \leq 360$

(e) $4 \cos(x + 26) + 3 = 0$ for $0 \leq x \leq 360$

(f) $\sqrt{2} \cos\left(x + \frac{\pi}{6}\right) + 1 = 0$ for $0 \leq x \leq 2\pi$

13

Solve the equations:

(a) $4 \sin^2 x = 3$ for $0 \leq x \leq 360$

(b) $4 \cos^2 x = 2$ for $0 \leq x \leq 2\pi$

(c) $\sin^2 x - 4 \sin x + 3 = 0$ for $0 \leq x \leq 360$

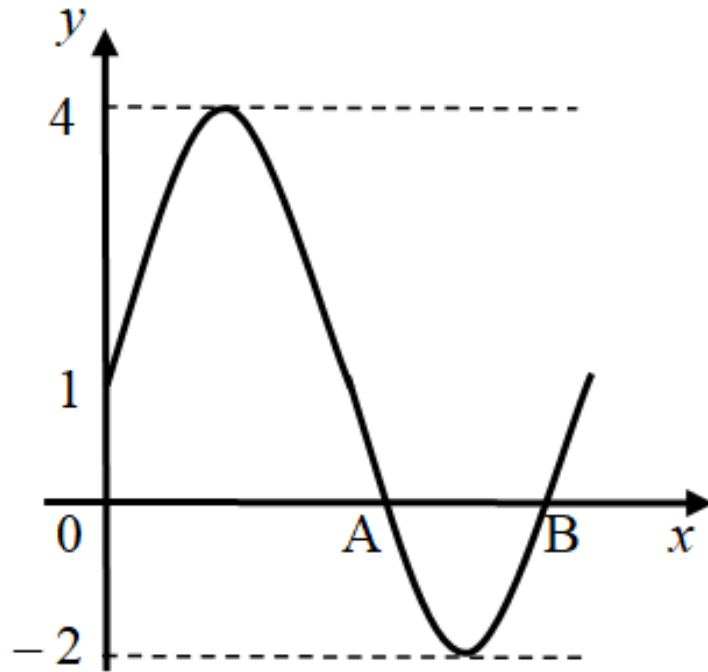
(d) $2 \cos^2 x + \cos x - 1 = 0$ for $0 \leq x \leq 360$

(e) $6 \sin^2 x + 5 \sin x + 1 = 0$ for $0 \leq x \leq 2\pi$

(f) $15 \cos^2 x + 7 \cos x - 2 = 0$ for $0 \leq x \leq 360$

14

The graph shows a curve with the equation $y = p \sin x^\circ + q$



- (a) Write down the values of p and q .
- (b) The curve crosses the x – axis at points A and B. Calculate the coordinates of A and B.