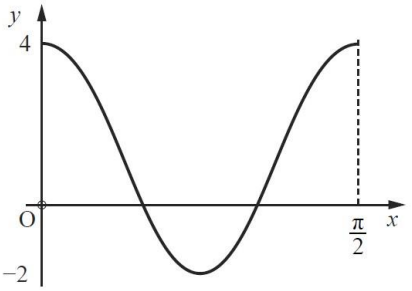
Trig Graphs & Equations

Go to the appropriate Past Paper for the answers

New 2015 Paper 1

4. The diagram shows part of the graph of the function $y = p\cos qx + r$.



Write down the values of p, q and r. **3**

Specimen 4 Paper 1

12. The voltage, $V(t)$, produced by a generator is described by the function $V(t) = 120\sin 100\pi t$, $t > 0$, where t is the time in seconds.

(a) Determine the period of $V(t)$. **2**

(b) Find the first three times for which $V(t) = -60$. **6**

Exemplar Paper 1

4. For the function $f(x) = 2 - 3\sin\left(x - \frac{\pi}{3}\right)$ in the interval $0 \le x < 2\pi$, determine which two of the following statements are true **and justify your answer**.

Statement A The maximum value of $f(x)$ is -1.

Statement B The maximum value of $f(x)$ is 5. **3**

Statement C The maximum value occurs when $x = \frac{5\pi}{6}$.

Statement D The maximum value occurs when $x = \frac{11\pi}{6}$.

2014 Paper 1

9. $\sin x + \sqrt{3}\cos x$ can be written as $2\cos\left(x - \frac{\pi}{6}\right)$.

The maximum value of $\sin x + \sqrt{3}\cos x$ is 2. **2**

What is the maximum value of $5\sin 2x + 5\sqrt{3}\cos 2x$?

2014 Paper 1

13. What is the value of $\sin\left(\frac{\pi}{3}\right) - \cos\left(\frac{5\pi}{4}\right)$? **2**

2014 Paper 2

6. Solve the equation

$$\sin x - 2\cos 2x = 1 \qquad \text{for } 0 \le x < 2\pi.$$

5

2013 Paper 1

15. Solve $\tan\left(\frac{x}{2}\right) = -1$ for $0 \le x < 2\pi$. **2**

2013 Paper 1

4. Sketch the graph of $y = 4\cos 2x - 1$, for $0 \le x \le \pi$? **2**

2012 Paper 1

12. Find the maximum value of

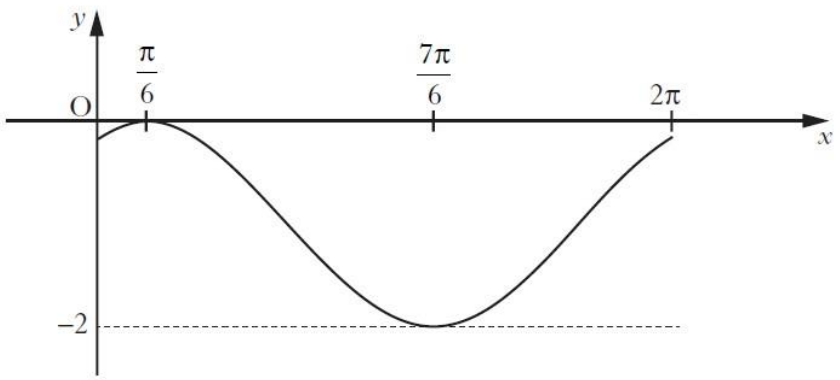
$$2 - 3\sin\left(x - \frac{\pi}{3}\right)$$

2

and the value of x where this occurs in the interval $0 \le x \le 2\pi$.

2012 Paper 2

9. The diagram shows the curve with equation of the form $y = \cos(x + a) + b$ for $0 \le x \le 2\pi$.



2

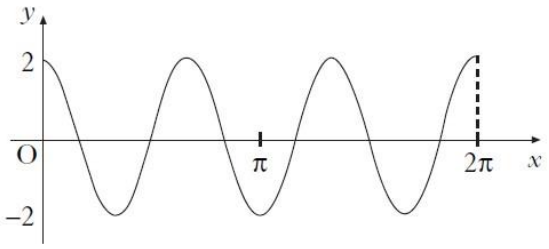
What is the equation of this curve?

2011 Paper 1

10. Solve $2\cos x = \sqrt{3}$ for x, where $0 \le x < 2\pi$. **2**

2010 Paper 1

4. The diagram shows the graph with equation of the form $y = a\cos bx$ for $0 \le x \le 2\pi$.



What is the equation of this graph? **2**

2009 Paper 1

11. How many solutions does the equation

$$(4\sin x - \sqrt{5})(\sin x + 1) = 0$$

have in the interval $0 \le x < 2\pi$? **2**

2009 Paper 1

14. If $f(x) = 2\sin\left(3x - \frac{\pi}{2}\right) + 5$, what is the range of values of $f(x)$? **2**

2008 Paper 1

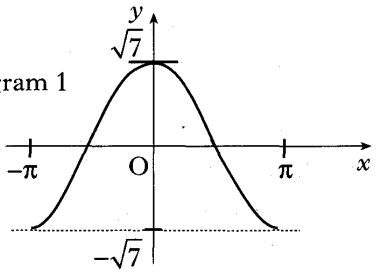
6. What is the solution of the equation $2\sin x - \sqrt{3} = 0$ where $\frac{\pi}{2} \le x \le \pi$? **2**

2008 Paper 2

3. (*a*) (i) Diagram 1 shows part of the graph of $y = f(x)$, where $f(x) = p\cos x$.

Write down the value of p.

Diagram 1

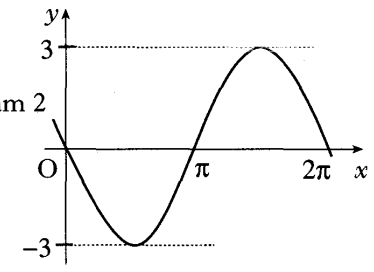


2

(ii) Diagram 2 shows part of the graph of $y = g(x)$, where $g(x) = q\sin x$.

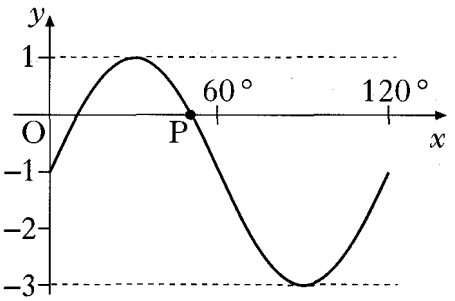
Write down the value of q.

Diagram 2



2007 Paper 2

4. The diagram shows part of the graph of a function whose equation is of the form $y = a\sin(bx°) + c$.



(*a*) Write down the values of a, b and c. **3**

(*b*) Determine the exact value of the x-coordinate of P, the point where the graph intersects the x-axis as shown in the diagram. **3**

2004 Paper 1

3. Find all the values of x in the interval $0 \leq x \leq 2\pi$ for which $\tan^2(x) = 3$. **4**