SQA Past paper questions

2023 – Paper 2 – Question 7

Solve the equation $\sin x° + 2 = 3\cos 2x°$ for $0 \leq x < 360$. 5

Click here for video solution.

2022 – Paper 1 – Question 9

Solve the equation $\cos 2x° = 5\cos x° - 3$ for $0 \leq x < 360$. 5

Click here for video solution.

2019 – Paper 1 – Question 15

(a) Solve the equation $\sin 2x° + 6\cos x° = 0$ for $0 \leq x < 360$. 4

(b) Hence solve $\sin 4x° + 6\cos 2x° = 0$ for $0 \leq x < 360$. 1

Click here for video solution.

2018 – Paper 2 – Question 6

Functions, f and g, are given by $f(x) = 3 + \cos x$ and $g(x) = 2x$, $x \in \mathbb{R}$.

(a) Find expressions for

(i) $f(g(x))$ and 2

(ii) $g(f(x))$. 1

(b) Determine the value(s) of x for which $f(g(x)) = g(f(x))$ where $0 \leq x < 2\pi$. 6

Click here for video solution.

2017 – Paper 2 – Question 6

Solve $5\sin x - 4 = 2\cos 2x$ for $0 \leq x < 2\pi$. 5

Click here for video solution.

Exemplar – Paper 1 – Question 7

(a) Solve $\cos 2x° - 3\cos x° + 2 = 0$ for $0 \leq x < 360$. 5

(b) Hence solve $\cos 4x° - 3\cos 2x° + 2 = 0$ for $0 \leq x < 360$. 2

Click here for video solution.

Specimen – Paper 1 – Question 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

Click here for video solution.

2014 – Paper 2 – Question 6

Solve the equation

$$\sin x - 2\cos 2x = 1 \qquad \text{for } 0 \leq x < 2\pi. \qquad 5$$

Click here for video solution.

2013 – Paper 2 – Question 8

Solve algebraically the equation

$$\sin 2x = 2\cos^2 x \qquad \text{for } 0 \leq x < 2\pi \qquad 6$$

Click here for video solution.

2012 – Paper 2 – Question 6

For $0 < x < \frac{\pi}{2}$, sequences can be generated using the recurrence relation

$$u_{n+1} = (\sin x)u_n + \cos 2x, \text{ with } u_0 = 1.$$

(a) Why do these sequences have a limit? 2

(b) The limit of one sequence generated by this recurrence relation is $\frac{1}{2}\sin x$.
Find the value(s) of x. 7

Click here for video solution.

2010 – Paper 2 – Question 4

Solve $2\cos 2x - 5\cos x - 4 = 0$ for $0 \leq x < 2\pi$. 5

Click here for video solution.

2008 – Paper 2 – Question 5

Solve the equation $\cos 2x° + 2\sin x° = \sin^2 x°$ in the interval $0 \leq x < 360$. 5

Click here for video solution.

Specimen 2 – Paper 1 – Question 23

Solve the equation $\sin 2x - \cos x = 0$ for $0 \leq x \leq 2\pi$. **5**

Click here for video solution.

2007 – Paper 1 – Question 6

Solve the equation $\sin 2x° = 6\cos x°$ for $0 \leq x \leq 360$. **4**

Click here for video solution.

Specimen 1 – Paper 1 – Question 24

Find the solution(s) of the equation $\sin^2 p - \sin p + 1 = \cos^2 p$ for $\frac{\pi}{2} < p < \pi$. **5**

Click here for video solution.

2006 – Paper 1 – Question 7

Solve the equation $\sin x° - \sin 2x° = 0$ in the interval $0 \leq x \leq 360$. 4

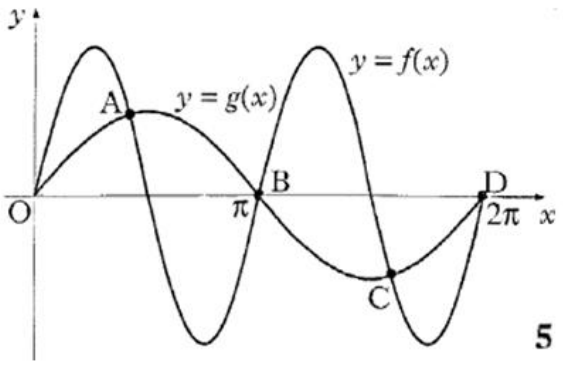
Click here for video solution.

2005 – Paper 2 – Question 8

Two functions, f and g, are defined by $f(x) = k\sin 2x$ and $g(x) = \sin x$ where $k > 1$.

The diagram shows the graphs of $y = f(x)$ and $y = g(x)$ intersecting at O, A, B, C and D.

Show that, at A and C, $\cos x = \frac{1}{2k}$.



5

Click here for video solution.

2004 – Paper 1 – Question 3

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

Click here for video solution.

2002 – Paper 1 – Question 3

Functions f and g are defined on suitable domains by $f(x) = \sin(x°)$ and $g(x) = 2x$.

(*a*) Find expressions for:

(i) $f(g(x))$;

(ii) $g(f(x))$. **2**

(*b*) Solve $2f(g(x)) = g(f(x))$ for $0 \leq x \leq 360$. **5**

Click here for video solution.

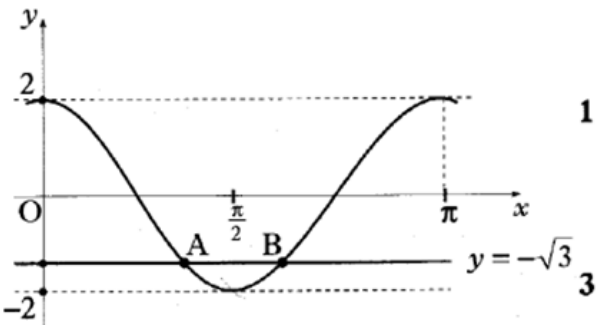
2002 – Paper 1 – Question 8

The diagram shows the graph of a cosine function from 0 to π.

(*a*) State the equation of the graph. **1**

(*b*) The line with equation $y = -\sqrt{3}$ intersects this graph at points A and B.

Find the coordinates of B. **3**



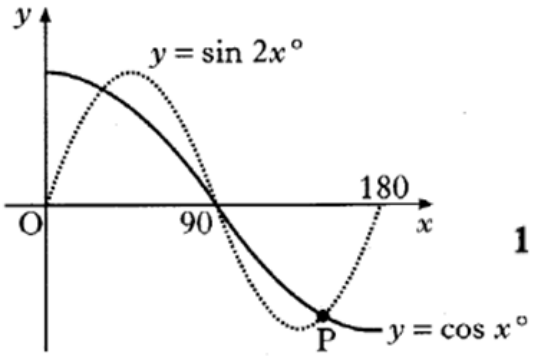
Click here for video solution.

2001 – Paper 1 – Question 5

(*a*) Solve the equation $\sin 2x° - \cos x° = 0$ in the interval $0 \leq x \leq 180$. **4**

(*b*) The diagram shows parts of two trigonometric graphs, $y = \sin 2x°$ and $y = \cos x°$.

Use your solutions in (*a*) to write down the coordinates of the point P. **1**



Click here for video solution.

2000 – Paper 2 – Question 5

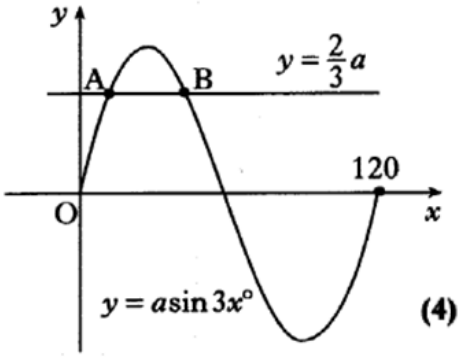
Solve the equation $3\cos 2x° + \cos x° = -1$ in the interval $0 \leq x \leq 360$. **5**

Click here for video solution.

1999 – Paper 1 – Question 14

The diagram shows part of the graph of $y = a\sin 3x°$ and the line with equation $y = \frac{2}{3}a$.

Find the x-coordinates of A and B. **(4)**



Click here for video solution.

1998 – Paper 1 – Question 9

Solve the equation $2\sin\left(2x - \frac{\pi}{6}\right) = 1, \quad 0 \leq x < 2\pi.$ **(4)**

Click here for video solution.

1997 – Paper 1 – Question 18

(a) Show that $2\cos 2x° - \cos^2 x° = 1 - 3\sin^2 x°$. (2)

(b) Hence solve the equation

$2\cos 2x° - \cos^2 x° = 2\sin x°$ in the interval $0 \leq x < 360$. (4)

Click here for video solution.

1996 – Paper 1 – Question 10

Solve algebraically the equation

$\sin 2x° + \sin x° = 0, \quad 0 \leq x < 360.$ (5)

Click here for video solution.