Old Past Papers - Trigonometry
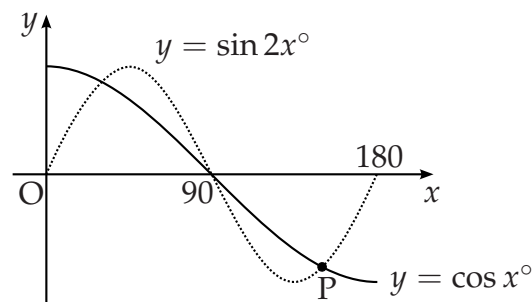
[SQA] 1. Solve the equation $3\cos 2x° + \cos x° = -1$ in the interval $0 \leq x \leq 360$. **5**

[SQA] 2. (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**

[SQA] 3. Functions f and g are defined on suitable domains by $f(x) = \sin(x°)$ and $g(x) = 2x$.
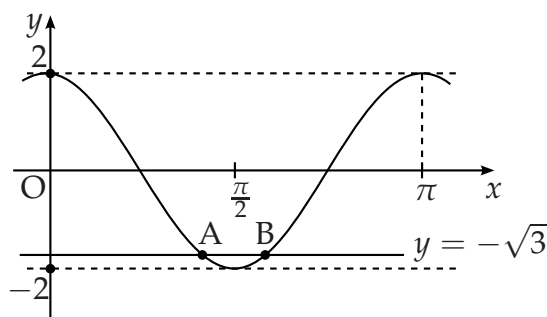
(a) Find expressions for:

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

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

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

[SQA] 4. 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 point A and B.

Find the coordinates of B. **3**

[SQA] 5. Functions $f(x) = \sin x$, $g(x) = \cos x$ and $h(x) = x + \frac{\pi}{4}$ are defined on a suitable set of real numbers.
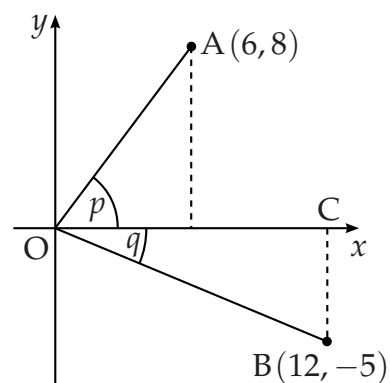
(a) Find expressions for:

(i) $f(h(x))$;

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

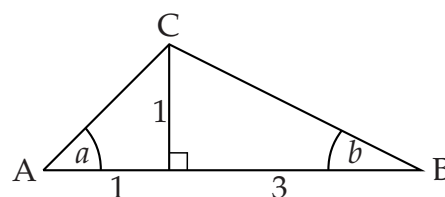(b) (i) Show that $f(h(x)) = \frac{1}{\sqrt{2}}\sin x + \frac{1}{\sqrt{2}}\cos x$.

(ii) Find a similar expression for $g(h(x))$ and hence solve the equation $f(h(x)) - g(h(x)) = 1$ for $0 \leq x \leq 2\pi$. **5**

[SQA] 6. On the coordinate diagram shown, A is the point $(6, 8)$ and B is the point $(12, -5)$. Angle AOC $= p$ and angle COB $= q$.

Find the exact value of $\sin(p + q)$.

4

[SQA] 7. In triangle ABC, show that the exact value of $\sin(a + b)$ is $\dfrac{2}{\sqrt{5}}$.

4

[END OF QUESTIONS]