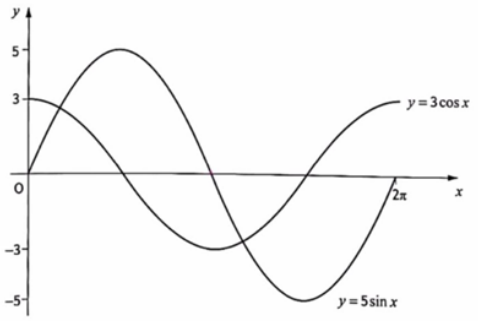
# SQA Past paper questions

## 2023 – Paper 1 – Question 11

(a) Evaluate $\int_{\frac{\pi}{2}}^{\pi} (5\sin x - 3\cos x)\, dx$. 3

The diagram in your answer booklet shows the graphs with equations $y = 5\sin x$ and $y = 3\cos x$, $0 \leq x \leq 2\pi$.

(b) On the diagram in your answer booklet, shade the area represented by the integral in (a). 1




Click here for video solution.

## 2023 – Paper 2 – Question 3

Find $\int 7\cos\left(4x + \frac{\pi}{3}\right) dx$. 2

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## 2022 – Paper 1 – Question 6

Evaluate $\int_{-5}^{2} (10 - 3x)^{-\frac{1}{2}}\, dx$. 4

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## 2019 – Paper 1 – Question 11

Evaluate $\int_0^{\frac{\pi}{9}} \cos\left(3x-\frac{\pi}{6}\right)dx.$ 4

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## 2019 – Paper 1 – Question 17

(a) Express $(\sin x-\cos x)^2$ in the form $p+q\sin rx$ where $p$, $q$ and $r$ are integers. 3

(b) Hence, find $\int(\sin x-\cos x)^2\,dx.$ 2

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## 2018 – Paper 1 – Question 14

Evaluate $\int_{-4}^{9} \frac{1}{\sqrt[3]{(2x+9)^2}}dx.$ 5

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## 2017 – Paper 1 – Question 13

Find $\int \frac{1}{(5-4x)^{\frac{1}{2}}}dx, \quad x<\frac{5}{4}.$ 4

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## 2016 – Paper 1 – Question 5

Find $\int 8\cos(4x+1)\,dx.$ 2

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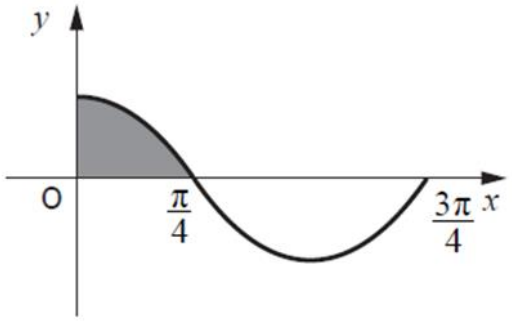
## 2015 – Paper 1 – Question 12

The diagram shows part of the graph of $y = a\cos bx$.

The shaded area is $\frac{1}{2}$ unit$^2$.




What is the value of $\int_0^{\frac{3\pi}{4}} (a\cos bx)dx$? 2

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## 2015 – Paper 2 – Question 7

(a) Find $\int (3\cos 2x + 1)dx$. 2

(b) Show that $3\cos 2x + 1 = 4\cos^2 x - 2\sin^2 x$. 2

(c) Hence, or otherwise, find $\int (\sin^2 x - 2\cos^2 x)dx$. 2

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## 2014 – Paper 2 – Question 5

Given that $\int_4^t (3x+4)^{-\frac{1}{2}}\,dx = 2$, find the value of $t$. 5

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## 2013 – Paper 2 – Question 6

Given that $\int_0^a 5\sin 3x\, dx = \frac{10}{3}, \quad 0 \le a < \pi,$

calculate the value of $a$. **5**

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## 2009 – Paper 2 – Question 5

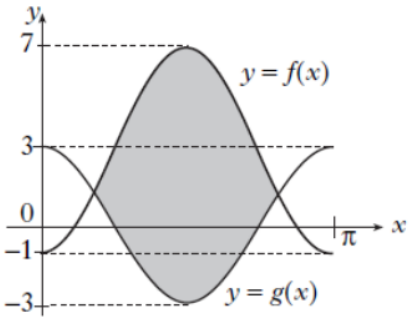
The graphs of $y = f(x)$ and $y = g(x)$ are shown in the diagram.

$f(x) = -4\cos(2x) + 3$ and $g(x)$ is of the form $g(x) = m\cos(nx)$.

(a) Write down the values of $m$ and $n$. **1**

(b) Find, correct to one decimal place, the coordinates of the points of intersection of the two graphs in the interval $0 \le x \le \pi$. **5**

(c) Calculate the shaded area. **6**

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## 2007 – Paper 2 – Question 7

Find the value of $\int_0^2 \sin(4x+1)\, dx$. **4**

Click here for video solution.

## 2004 – Paper 1 – Question 7

Find $\int_0^2 \sqrt{4x+1}\, dx$. **5**

Click here for video solution.

## 2003 – Paper 1 – Question 8

Find $\int_0^1 \frac{dx}{(3x+1)^{\frac{1}{2}}}$. 4

Click here for video solution.

## 2000 – Paper 2 – Question 10

Find $\int \frac{1}{(7-3x)^2}\,dx$. 2

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## 2000 – Paper 1 – Question 8

The graph of $y = f(x)$ passes through the point $\left(\frac{\pi}{9}, 1\right)$.

If $f'(x) = \sin(3x)$ express $y$ in terms of $x$. 4

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