

SQA Past paper questions

2023 - Paper 2 - Question 5

A function, f , is defined by $f(x) = (3 - 2x)^4$, where $x \in \mathbb{R}$.

Calculate the rate of change of f when $x = 4$.

3

Click [here](#) for video solution. 

2022 - Paper 1 - Question 12

Given that $f(x) = 4 \sin\left(3x - \frac{\pi}{3}\right)$, evaluate $f'\left(\frac{\pi}{6}\right)$.

3

Click [here](#) for video solution. 

2019 - Paper 1 - Question 6

Given that $y = \frac{1}{(1-3x)^5}$, $x \neq \frac{1}{3}$, find $\frac{dy}{dx}$.

3

Click [here](#) for video solution. 

2018 - Paper 1 - Question 3

Given $h(x) = 3 \cos 2x$, find the value of $h'\left(\frac{\pi}{6}\right)$.

3

Click [here](#) for video solution. 

2017 - Paper 1 - Question 3

Given $y = (4x - 1)^{12}$, find $\frac{dy}{dx}$.

2

Click [here](#) for video solution. 

2017 - Paper 2 - Question 11

(a) Show that $\frac{\sin 2x}{2 \cos x} - \sin x \cos^2 x = \sin^3 x$, where $0 < x < \frac{\pi}{2}$. 3

(b) Hence, differentiate $\frac{\sin 2x}{2 \cos x} - \sin x \cos^2 x$, where $0 < x < \frac{\pi}{2}$. 3

Click [here](#) for video solution. 

2016 - Paper 2 - Question 10

(a) Given that $y = (x^2 + 7)^{\frac{1}{2}}$, find $\frac{dy}{dx}$. 2

(b) Hence find $\int \frac{4x}{\sqrt{x^2 + 7}} dx$. 1

Click [here](#) for video solution. 

2016 - Paper 2 - Question 11

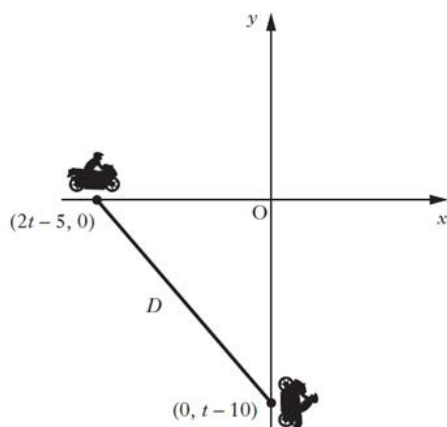
(a) Show that $\sin 2x \tan x = 1 - \cos 2x$, where $\frac{\pi}{2} < x < \frac{3\pi}{2}$. 4

(b) Given that $f(x) = \sin 2x \tan x$, find $f'(x)$. 2

Click [here](#) for video solution. 

2015 - Paper 1 - Question 24

A stunt performed by two members of a motorcycle display team requires them to travel, at speed, at right angles to each other across the arena.



The positions of the motorcyclists, relative to suitable axes, t seconds after the stunt begins, are $(2t - 5, 0)$ and $(0, t - 10)$.

- (a) Show that, at any given moment, the distance, D , between them is given by

2

$$D = \sqrt{5t^2 - 40t + 125}.$$

- (b) Determine whether the distance between the motorcyclists is increasing or decreasing 5 seconds after the start of the stunt.

4

Click [here](#) for video solution. 

Specimen - Paper 1 - Question 10

Find the rate of change of the function $f(x) = 4\sin^3 x$ when $x = \frac{5\pi}{6}$. 3

Click [here](#) for video solution. 

2010 - Paper 2 - Question 6

A curve has equation $y = (2x - 9)^{\frac{1}{2}}$.

Show that the equation of the tangent to this curve at the point where $x = 9$ is $y = \frac{1}{3}x$. 5

Click [here](#) for video solution. 

2007 - Paper 1 - Question 10

Given that $y = \sqrt{3x^2 + 2}$, find $\frac{dy}{dx}$. **3**

Click [here](#) for video solution. 

2006 - Paper 1 - Question 5

A function f is defined by $f(x) = (2x - 1)^5$.
Find the coordinates of the stationary point on the graph with equation $y = f(x)$ and determine its nature. **7**

Click [here](#) for video solution. 

2006 - Paper 2 - Question 9

If $y = \frac{1}{x^3} - \cos 2x$, $x \neq 0$, find $\frac{dy}{dx}$. **4**

Click [here](#) for video solution. 

2005 - Paper 1 - Question 5

Differentiate $(1 + 2 \sin x)^4$ with respect to x . **2**

Click [here](#) for video solution. 

2004 - Paper 1 - Question 6

Given that $y = 3\sin(x) + \cos(2x)$, find $\frac{dy}{dx}$. **3**

Click [here](#) for video solution. 

2003 - Paper 2 - Question 6

If $f(x) = \cos(2x) - 3 \sin(4x)$, find the exact value of $f'\left(\frac{\pi}{6}\right)$. **4**

Click [here](#) for video solution. 

2002 - Paper 1 - Question 10

(a) Find the derivative of the function $f(x) = (8 - x^3)^{\frac{1}{2}}$, $x < 2$. **2**

(b) Hence write down $\int \frac{x^2}{(8 - x^3)^{\frac{1}{2}}} dx$. **1**

Click here for video solution. 

2002 - Paper 2 - Question 6

Find the equation of the tangent to the curve $y = 2 \sin\left(x - \frac{\pi}{6}\right)$ at the point where $x = \frac{\pi}{3}$. **4**

Click here for video solution. 

2000 - Paper 2 - Question 8

Given that $f(x) = (5x - 4)^{\frac{1}{2}}$, evaluate $f'(4)$. **3**

Click [here](#) for video solution. 

1999 - Paper 2 - Question 10

Given $f(x) = \cos^2 x - \sin^2 x$, find $f'(x)$. **3**

Click [here](#) for video solution. 

1998 - Paper 1 - Question 16

Given $f(x) = (\sin x + 1)^2$, find the exact value of $f'\left(\frac{\pi}{6}\right)$. **(3)**

Click here for video solution. 