SQA Past paper questions

2023 – Paper 2 – Question 12

A curve, for which $\frac{dy}{dx} = 8x^3 + 3$, passes through the point $(-1, 3)$.

Express y in terms of x. 4

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2022 – Paper 2 – Question 6

A curve with equation $y = f(x)$ is such that $\frac{dy}{dx} = 1 - \frac{3}{x^2}$, where $x > 0$.

The curve passes through the point $(3, 6)$.

Express y in terms of x. 5

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2019 – Paper 2 – Question 13

For a function, f, defined on the set of real numbers, $\mathbb{R}$, it is known that

- the rate of change of f with respect to x is given by $3x^2 - 16x + 11$
- the graph with equation $y = f(x)$ crosses the x-axis at $(7,0)$.

Express $f(x)$ in terms of x. 5

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2018 – Paper 1 – Question 10

Given that

- $\frac{dy}{dx} = 6x^2 - 3x + 4$, and
- $y = 14$ when $x = 2$,

express y in terms of x. 4

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2016 – Paper 2 – Question 9

For a function f, defined on a suitable domain, it is known that:

- $f'(x) = \frac{2x+1}{\sqrt{x}}$
- $f(9) = 40$

Express $f(x)$ in terms of x. 4

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2015 – Paper 1 – Question 15

The rate of change of the temperature, T °C of a mug of coffee is given by

$$\frac{dT}{dt} = \frac{1}{25}t - k \ , \ 0 \leq t \leq 50$$

- t is the elapsed time, in minutes, after the coffee is poured into the mug
- k is a constant
- initially, the temperature of the coffee is 100 °C
- 10 minutes later the temperature has fallen to 82 °C.

Express T in terms of t. 6

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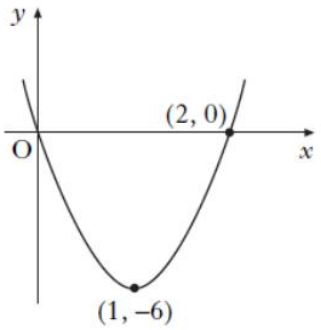
Specimen 2 – Paper 1 – Question 25

The diagram shows a parabola with equation

$$y = 6x(x-2).$$

This parabola is the graph of $y = f'(x)$.

Given that $f(1) = 4$, find the formula for $f(x)$.



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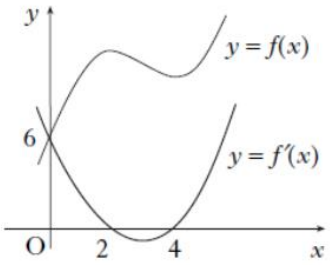
2007 – Paper 2 – Question 10

The diagram shows the graphs of a cubic function $y = f(x)$ and its derived function $y = f'(x)$.

Both graphs pass through the point (0, 6).

The graph of $y = f'(x)$ also passes through the points (2, 0) and (4, 0).



(a) Given that $f'(x)$ is of the form $k(x-a)(x-b)$:

(i) write down the values of a and b; 3

(ii) find the value of k.

(b) Find the equation of the graph of the cubic function $y = f(x)$. 4

Click here for video solution.

2006 – Paper 2 – Question 5

The curve $y = f(x)$ is such that $\frac{dy}{dx} = 4x - 6x^2$. The curve passes through the point (–1, 9). Express y in terms of x. 4

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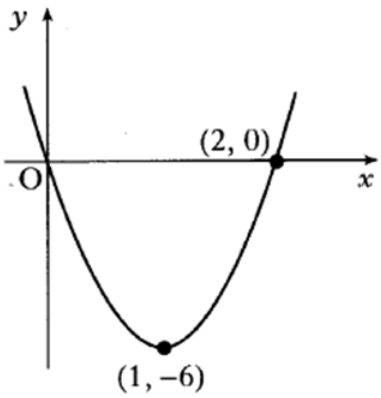
2004 – Paper 1 – Question 11

The diagram shows a parabola passing through the points (0, 0), (1, –6) and (2, 0).



(a) The equation of the parabola is of the form $y = ax(x-b)$.

Find the values of a and b. 3

(b) This parabola is the graph of $y = f'(x)$.

Given that $f(1) = 4$, find the formula for $f(x)$. 5

Click here for video solution.

1998 – Paper 1 – Question 10

A curve, for which $\frac{dy}{dx} = 6x^2 - 2x$, passes through the point (–1, 2).

Express y in terms of x. (3)

Click here for video solution.

1992 – Paper 1 – Question 4

A curve for which $\frac{dy}{dx} = 3x^2 + 1$ passes through the point $(-1, 2)$.
Express y in terms of x. (4)

Click here for video solution.

1991 – Paper 1 – Question 10

A curve with equation $y = f(x)$ passes through the point $(2, -1)$ and is such that $f'(x) = 4x^3 - 1$.
Express $f(x)$ in terms of x. (5)

Click here for video solution.

1990 – Paper 1 – Question 8

For all points on a curve $y = f(x)$, $f'(x) = 1 - 2x$.
If the curve passes through the point $(2, 1)$, find the equation of the curve. (3)

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1987 – Paper 1 – Question 8

The point $(-2, -1)$ lies on the graph of a function f and $f'(x) = 3x^2 - 12$.
Find $f(x)$. (4)

Click here for video solution.