SQA Past paper questions

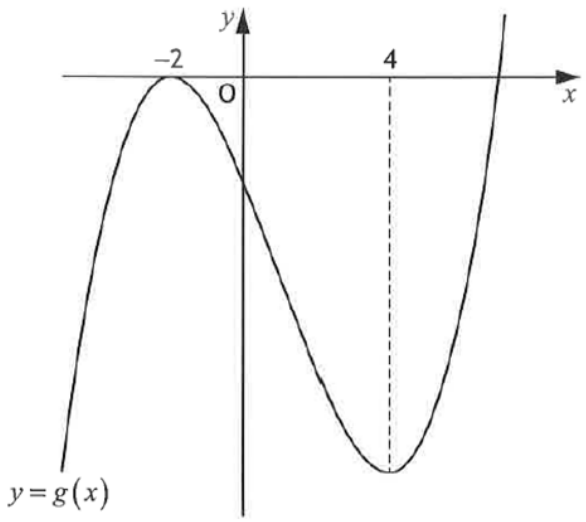
2023 – Paper 2 – Question 10

Determine the range of values of x for which the function $f(x) = 2x^3 + 9x^2 - 24x + 6$ is strictly decreasing. 4

Click here for video solution.

2019 – Paper 2 – Question 5

The diagram below shows the graph of a cubic function $y = g(x)$, with stationary points at $x = -2$ and $x = 4$.



On the diagram in your answer booklet, sketch the graph of $y = g'(x)$. 2

Click here for video solution.

2018 – Paper 2 – Question 3

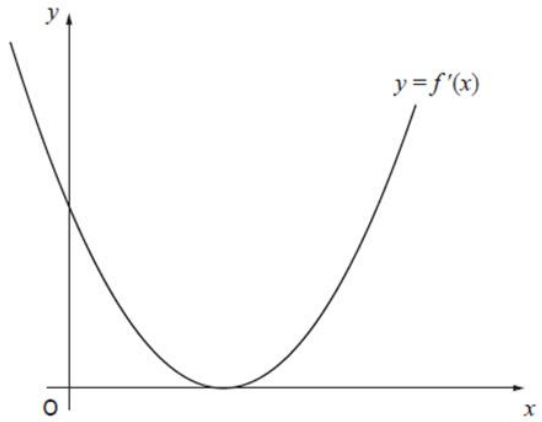
A function, f, is defined on the set of real numbers by $f(x) = x^3 - 7x - 6$.

Determine whether f is increasing or decreasing when $x = 2$. 3

Click here for video solution.

Specimen – Paper 1 – Question 11

The diagram shows the graph of $y = f'(x)$. The x-axis is a tangent to this graph.



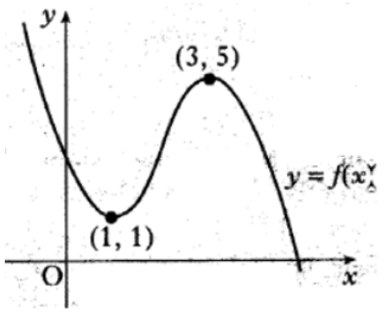
(a) Explain why the function $f(x)$ is never decreasing. 1

(b) On a graph of $y = f(x)$, the y-coordinate of the stationary point is negative. Sketch a possible graph for $y = f(x)$. 2

Click here for video solution.

2004 – Paper 1 – Question 7

The graph of the cubic function $y = f(x)$ is shown in the diagram. There are turning points at (1, 1) and (3, 5).
Sketch the graph of $y = f'(x)$.

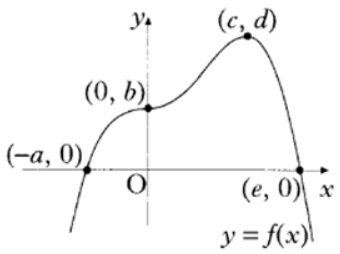


3

Click here for video solution.

2002 – Paper 1 – Question 6

The graph of a function f intersects the x-axis at $(-a, 0)$ and $(e, 0)$ as shown.
There is a point of inflexion at $(0, b)$ and a maximum turning point at (c, d).
Sketch the graph of the derived function f'.



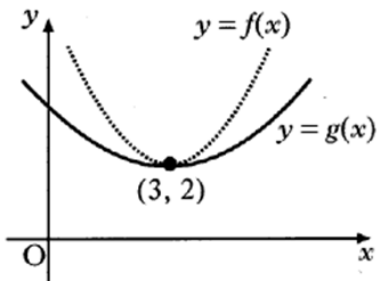
3

Click here for video solution.

2001 – Paper 1 – Question 9

The diagram shows the graphs of two quadratic functions $y = f(x)$ and $y = g(x)$. Both graphs have a minimum turning point at (3, 2).

Sketch the graph of $y = f'(x)$ and on the same diagram sketch the graph of $y = g'(x)$.



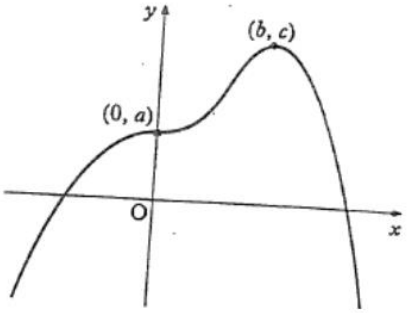
2

Click here for video solution.

1997 – Paper 1 – Question 16

The diagram shows a sketch of part of the graph of $y = f(x)$. The graph has a point of inflection at $(0, a)$ and a maximum turning point at (b, c).

sketch the graph of $y = f'(x)$. **(2)**



Click here for video solution.

1996 – Paper 1 – Question 16

Find algebraically the values of x for which the function $f(x) = 2x^3 - 3x^2 - 36x$ is increasing? **4**

Click here for video solution.

1995 – Paper 1 – Question 10

The point $P(-2, b)$ lies on the graph of the function $f(x) = 3x^3 - x^2 - 7x + 4$.

(a) Find the value of b. **1**

(b) Prove that this function is increasing at P. **3**

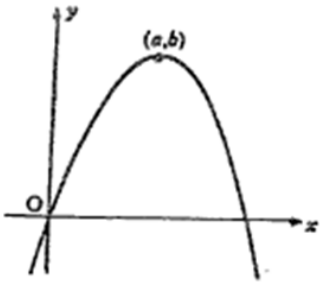
Click here for video solution.

1992 – Paper 1 – Question 19

The line with equation $y = x$ is a tangent at the origin to the parabola with equation $y = f(x)$.

The parabola has a maximum turning point at (a, b).

Sketch the graph of $y = f'(x)$. **4**

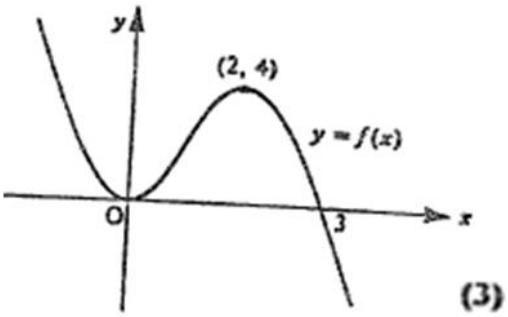


Click here for video solution.

1990 – Paper 1 – Question 11

The diagram opposite shows a sketch of the cubic function f with stationary points at (0, 0) and (2, 4).

Sketch the graph of the derived function f'.



(3)

Click here for video solution.

1990 – Paper 1 – Question 16

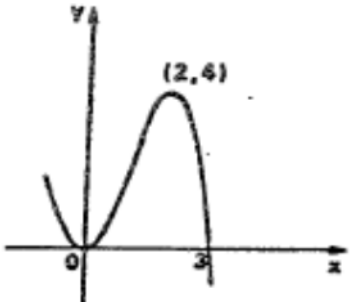
For what values of x is the function $f(x) = \frac{1}{3}x^3 - 2x^2 - 5x - 4$ increasing? **5**

Click here for video solution.

1988 – Paper 1 – Question 22

The sketch shows the graph of a cubic function $y = f(x)$.

Make a rough sketch of $y = f'(x)$. **3**



Click here for video solution.