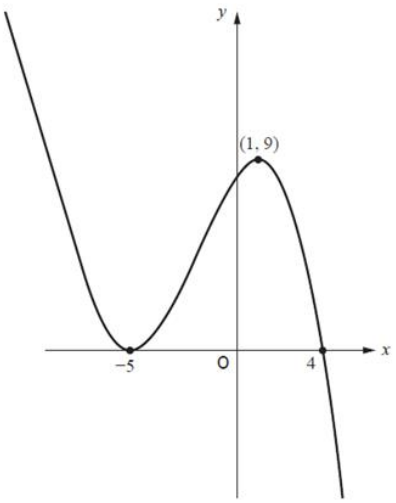
# SQA Past paper questions

## 2016 – Paper 1 – Question 15

The diagram below shows the graph with equation $y = f(x)$, where $f(x) = k(x-a)(x-b)^2$.




(a) Find the values of $a$, $b$ and $k$. 3

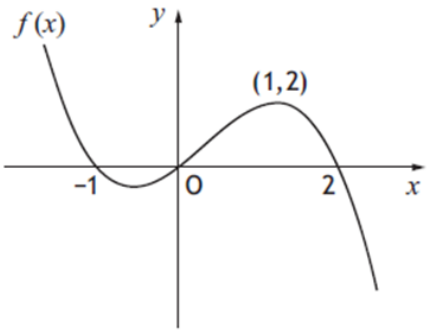
(b) For the function $g(x) = f(x) - d$, where $d$ is positive, determine the range of values of $d$ for which $g(x)$ has exactly one real root. 1

Click here for video solution.

## Exemplar – Paper 1 – Question 2

The diagram shows the curve with equation $y = f(x)$, where $f(x) = kx(x+a)(x+b)$.

The curve passes through (-1,0), (0,0), (1,2) and (2,0).

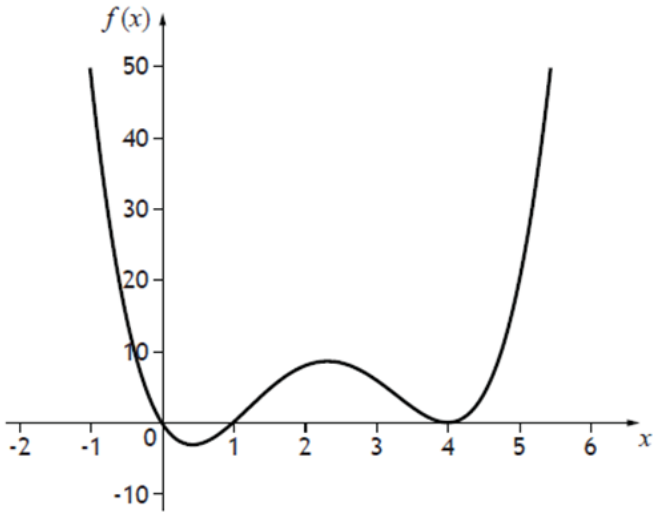



Find the values of $a$, $b$ and $k$. 3

Click here for video solution.

## Specimen – Paper 2 – Question 3

The diagram shows the graph of $f(x) = x(x-p)(x-q)^2$.




(a) Determine the values of $p$ and $q$. 1

(b) Find the equation of the tangent to the curve when $x = 1$. 4

Click here for video solution.

## 2015 – Paper 1 – Question 15

The graph of a cubic function, $y = f(x)$, is shown below.

It passes through the points $(-2, 0)$, $(-1, 0)$, $(3, 0)$ and $(0, -3)$.

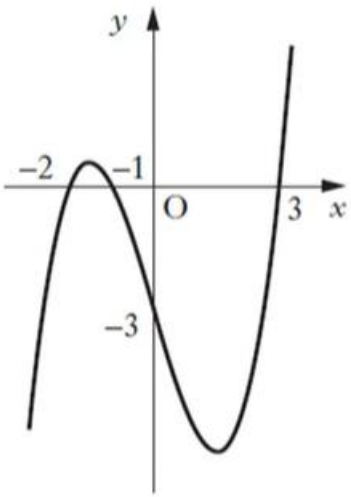
What is the equation of this curve?

A $y = \frac{1}{2}(x-3)(x+1)(x+2)$

B $y = 2(x-3)(x+1)(x+2)$

C $y = -\frac{1}{2}(x+3)(x-1)(x-2)$

D $y = -2(x+3)(x-1)(x-2)$




Click here for video solution.

## 2014 – Paper 1 – Question 15

The diagram shows a cubic curve passing through (–1, 0), (2, 0) and (0, –8).

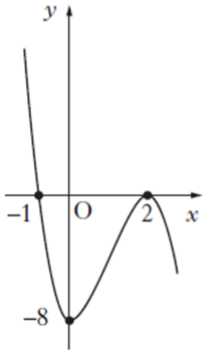
What is the equation of the curve?

A $y = -2(x+1)^2(x+2)$

B $y = -2(x+1)(x-2)^2$

C $y = 4(x+1)(x-2)$

D $y = -8(x+1)(x-2)^2$



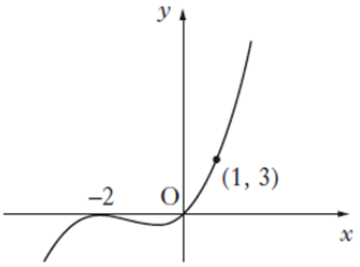

Click here for video solution.

## 2013 – Paper 1 – Question 17

The diagram shows a curve with equation of the form $y = kx(x + a)^2$, which passes through the points (–2, 0), (0, 0) and (1, 3).

What are the values of $a$ and $k$?

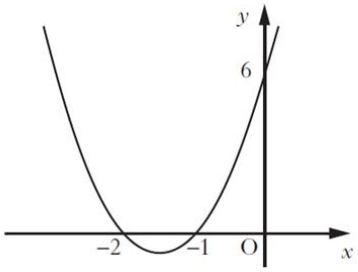
| | $a$ | $k$ |
|---|---|---|
| A | –2 | $\frac{1}{3}$ |
| B | –2 | 3 |
| C | 2 | $\frac{1}{3}$ |
| D | 2 | 3 |




Click here for video solution.

## 2012 – Paper 1 – Question 18

A parabola intersects the axes at $x = -2$, $x = -1$ and $y = 6$, as shown in the diagram.




What is the equation of the parabola?

A $y = 6(x-1)(x-2)$

B $y = 6(x+1)(x+2)$

C $y = 3(x-1)(x-2)$

D $y = 3(x+1)(x+2)$

Click here for video solution.

## 2011 – Paper 1 – Question 17

The diagram shows the graph of a cubic.

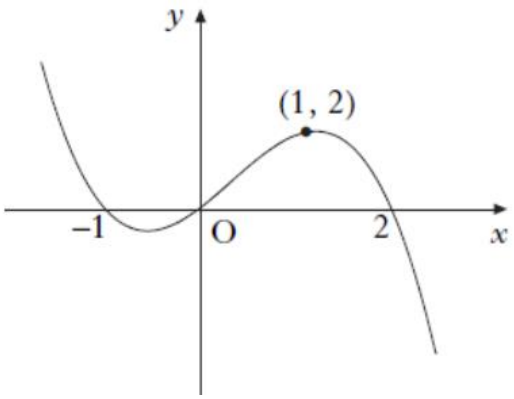
What is the equation of this cubic?

A $y = -x(x+1)(x-2)$

B $y = -x(x-1)(x+2)$

C $y = x(x+1)(x-2)$

D $y = x(x-1)(x+2)$



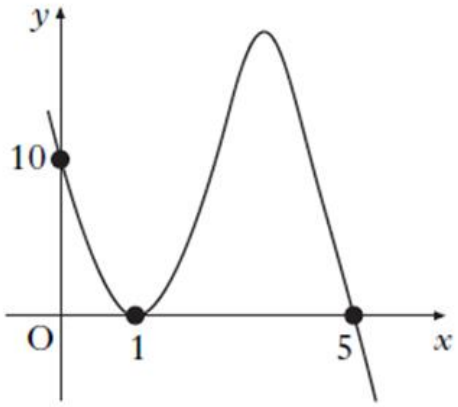

Click here for video solution.

## 2010 – Paper 1 – Question 16

The diagram shows the graph with equation $y = k(x-1)^2(x+t)$.

What are the values of $k$ and $t$?

| | $k$ | $t$ |
|---|---|---|
| A | −2 | −5 |
| B | −2 | 5 |
| C | 2 | −5 |
| D | 2 | 5 |

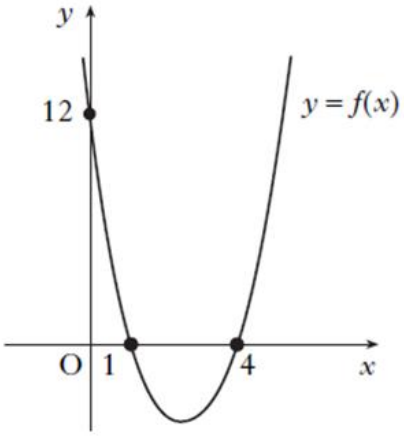



Click here for video solution.

## 2008 – Paper 1 – Question 13

The diagram shows part of the graph of a quadratic function $y = f(x)$.

The graph has an equation of the form $y = k(x - a)(x - b)$.




What is the equation of the graph?

A $y = 3(x - 1)(x - 4)$ C $y = 12(x - 1)(x - 4)$

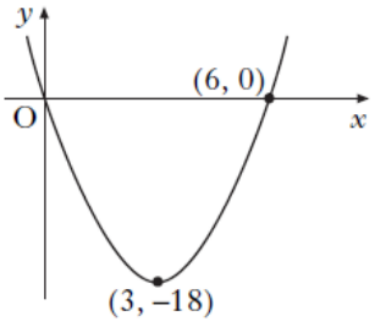
B $y = 3(x + 1)(x + 4)$ D $y = 12(x + 1)(x + 4)$

Click here for video solution.

## Specimen 2 – Paper 1 – Question 17

The equation of the parabola shown is of the form $y = kx(x - 6)$.

What is the value of $k$?




A 0 C 2

B $\frac{1}{144}$ D 6

Click here for video solution.