SQA Past paper questions

2023 – Paper 1 – Question 5

The equation $2x^2+(3p-2)x+p=0$ has equal roots.

Determine the possible values of p. 3

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2022 – Paper 2 – Question 2

The equation $2x^2-8x+(4-p)=0$ has two real and distinct roots.

Determine the range of values for p. 3

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2019 – Paper 1 – Question 2

The equation $x^2+(k-5)x+1=0$ has equal roots.

Determine the possible values of k. 3

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2017 – Paper 1 – Question 4

Find the value of k for which the equation $x^2+4x+(k-5)=0$ has equal roots. 3

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2016 – Paper 2 – Question 2

Find the range of values for p such that $x^2-2x+3-p=0$ has no real roots. 3

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2015 – Paper 1 – Question 24

Find the range of values for k such that $kx^2 + 3x + 9k = 0$ has real roots. **4**

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Exemplar – Paper 2 – Question 3

Find the value of p such that the equation $x^2+(p+1)x+9=0$ has no real roots. **4**

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Specimen – Paper 1 – Question 4

Given that $2x^2 + px + p + 6 = 0$ has no real roots, find the range of values for p, where $p \in \mathbb{R}$. **4**

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2014 – Paper 1 – Question 23

Functions f and g are defined on suitable domains by

$$f(x) = x(x-1) + q \text{ and } g(x) = x + 3.$$

(a) Find an expression for $f(g(x))$. **2**

(b) Hence, find the value of q such that the equation $f(g(x)) = 0$ has equal roots. **4**

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2012 – Paper 2 – Question 1

Functions f and g are defined on the set of real numbers by

- $f(x) = x^2 + 3$
- $g(x) = x + 4$.

(a) Find expressions for:

(i) $f(g(x))$;

(ii) $g(f(x))$. 3

(b) Show that $f(g(x)) + g(f(x)) = 0$ has no real roots. 3

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2007 – Paper 1 – Question 4

Find the range of values of k such that the equation $kx^2 - x - 1 = 0$ has no real roots. 4

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2006 – Paper 2 – Question 2

Find the value of k such that the equation $kx^2 + kx + 6 = 0$, $k \neq 0$, has equal roots. 4

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2004 – Paper 2 – Question 3

Prove that the roots of the equation $2x^2 + px - 3 = 0$ are real for all values of p. 4

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2002 – Paper 2 – Question 9

Show that the equation $(1 - 2k)x^2 - 5kx - 2k = 0$ has real roots for all integer values of k. 5

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2001 – Paper 1 – Question 2

For what value of k does the equation $x^2 - 5x + (k + 6) = 0$ have equal roots? **3**

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1999 – Paper 1 – Question 16

A curve has equation $y = 2x^3 + 3x^2 + 4x - 5$.

Prove that this curve has no stationary points. **(5)**

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