Name: SOLUTIONS

GCSE (1 - 9)

Quadratic Inequalities

Solutions by
Kenneth Stafford
MATHS TUTOR
ken@kennethstafford.co.uk

These questions are compiled from released Pearson Edexcel GCSE maths exam papers

They contain exam questions from up until the ***November 2023*** exam series

More recent exam papers do exist but are withheld for mock exams

As new exam papers are released these worksheets will gradually be updated

The **most current** version of these worksheets will always be available at: kennethstafford.co.uk

Past Papers:	Similar Worksheets:
Solutions:	This worksheet:

1

Solve $2x^2 + 3x - 2 > 0$

$(2x - 1)(x + 2) > 0$

$\frac{1}{2}$ $\quad$ -2

$x < -2$

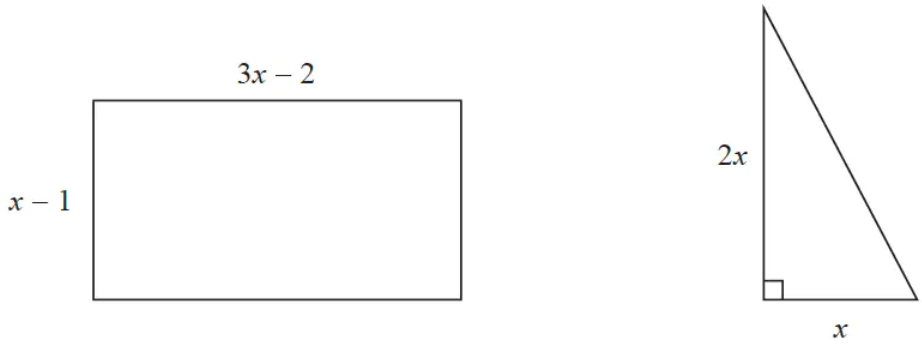
$x > \frac{1}{2}$

(Total for Question 19 is 3 marks)

[Edexcel, GCSE, Summer 2017, Paper 3H, Q19]

2

Here is a rectangle and a right-angled triangle.



All measurements are in centimetres.
The area of the rectangle is greater than the area of the triangle.

Find the set of possible values of x.

$(3x-2)(x-1) > \frac{1}{2}(2x)(x)$

$3x^2-3x-2x+2 > \frac{1}{2}(2x^2)$

$3x^2-5x+2 > x^2$

$2x^2-5x+2 > 0$

$(2x-1)(x-2) > 0$

$\frac{1}{2}$ 2

$x < \frac{1}{2}$ $x > 2$

$x > 2$

(Total for Question 23 is 5 marks)

[Edexcel, GCSE, Autumn 2017, Paper 1H, Q23]

3

n is an integer such that $3n + 2 \leqslant 14$ and $\dfrac{6n}{n^2 + 5} > 1$

Find all the possible values of n.

$3n + 2 \leq 14$

$3n \leq 12$

$n \leq 4$

$\frac{6n}{n^2+5} > 1$

$6n > n^2 + 5$

$0 > n^2 - 6n + 5$

$n^2 - 6n + 5 < 0$

$(n - 5)(n - 1) < 0$

$1 < n < 5$

2, 3 and 4 satisfy both inequalities

2, 3, 4

(Total for Question 20 is 5 marks)

[Edexcel, GCSE, Summer 2018, Paper 1H, Q20]

4

Solve $22 < \frac{m^2 + 7}{4} < 32$

Show all your working.

$22 < \frac{m^2+7}{4} < 32$

$88 < m^2 + 7 < 128$

$81 < m^2 < 121$

$\sqrt{81} < m < \sqrt{121}$

$9 < m < 11$ or $-11 < m < -9$

$9 < m < 11$

$-11 < m < -9$

(Total for Question 19 is 5 marks)

[Edexcel, GCSE, Autumn 2018, Paper 2H, Q19]

5

(a) Show that $(2x + 1)(x + 3)(3x + 7)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a, b, c and d are integers.

$(2x+1)(3x+7) = 6x^2 + 14x + 3x + 7$

$= 6x^2 + 17x + 7$

$(x+3)(6x^2+17x+7) = 6x^3 + 17x^2 + 7x$

$18x^2 + 51x + 21$

$6x^3 + 35x^2 + 58x + 21$

(3)

(b) Solve $(1-x)^2 < \frac{9}{25}$

$(1-x)^2 < \frac{9}{25}$

$1 - x < \pm\sqrt{\frac{9}{25}}$

$-\frac{3}{5} < 1 - x < \frac{3}{5}$

$-1\frac{3}{5} < -x < -\frac{2}{5}$

$\frac{2}{5} < x < 1\frac{3}{5}$

(3)

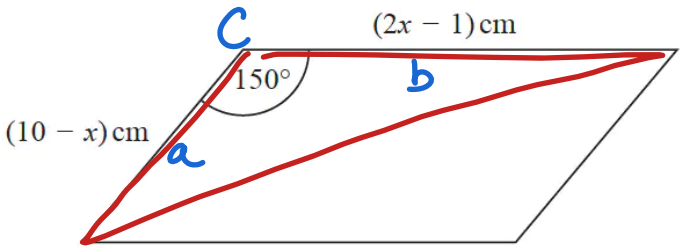
(Total for Question 18 is 6 marks)

[Edexcel, GCSE, Summer 2019, Paper 3H, Q18]

6

The diagram shows a parallelogram.

$\frac{1}{2}ab\sin C$



The area of the parallelogram is greater than 15 cm^2

$\frac{1}{2}(10-x)(2x-1)\times\sin(150)\times 2$

(a) Show that $2x^2 - 21x + 40 < 0$

$(10-x)(2x-1)\times\sin(150) > 15$

$(20x - 10 - 2x^2 + x)\times\frac{1}{2} > 15$

$-2x^2 + 21x - 10 > 30$

$-2x^2 + 21x - 40 > 0$

$2x^2 - 21x + 40 < 0$

(3)

(b) Find the range of possible values of x.

$2x^2 - 21x + 40 < 0$

$(2x - 5)(x - 8) < 0$

$\frac{5}{2}$ 8

$\frac{5}{2} < x < 8$

(3)

(Total for Question 23 is 6 marks)

[Edexcel, GCSE, Autumn 2019, Paper 2H, Q23]

7

Find algebraically the set of values of x for which

$$x^2 - 49 > 0 \quad \textbf{and} \quad 5x^2 - 31x - 72 > 0$$

.....

(Total for Question 22 is 5 marks)

[Edexcel, GCSE, Summer 2022, Paper 2H, Q22]

8

Find the set of possible values of x for which

$$4x^2 - 25 < 0 \quad \textbf{and} \quad 12 - 5x - 3x^2 > 0$$

You must show all your working.

.....

(Total for Question 24 is 5 marks)

[Edexcel, GCSE, Summer 2023, Paper 1H, Q24]

9

(a) Factorise $6x^2 - 5x - 4$

.....

(2)

(b) Hence, or otherwise, solve $6x^2 - 5x - 4 < 0$

.....

(2)

(Total for Question 17 is 4 marks)

[Edexcel, GCSE, November 2023, Paper 1H, Q17]

10

Given that $\frac{2x^2 + y^2}{4x^2 - y^2} = \frac{43}{11}$ where $x > 0$ and $y > 0$

find, in its simplest form, the ratio $x : y$

.....

(Total for Question 23 is 4 marks)

[Edexcel, GCSE, November 2023, Paper 3H, Q23]