Solving Quadratic Inequalities

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Examples

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Workout

Question 1: Solve the following inequalities

(a) $(x - 4)(x - 1) < 0$ (b) $(x - 2)(x + 1) < 0$ (c) $(x + 7)(x + 3) \leq 0$

(d) $(x - 5)(x + 4) \leq 0$ (e) $x(x - 9) > 0$ (f) $(x + 6)(x - 5) > 0$

(g) $(x + 10)(x + 1) \geq 0$ (h) $(x - 7)(x + 7) \geq 0$ (i) $(x + 8)(x + 2) < 0$

(j) $(x - 4)(x + 7) \geq 0$ (k) $(x + 1)(x - 5) \leq 0$ (l) $(x - 12)(x - 11) > 0$

Question 2: Solve the following inequalities

(a) $x^2 + 5x + 6 > 0$ (b) $x^2 + 7x + 10 < 0$ (c) $x^2 - 4x - 5 \leq 0$

(d) $x^2 + 2x - 24 > 0$ (e) $x^2 - 6x + 8 \geq 0$ (f) $x^2 + 3x - 4 < 0$

(g) $x^2 - x - 56 > 0$ (h) $x^2 + 9x + 18 < 0$ (i) $x^2 - 13x + 22 \leq 0$

(j) $x^2 - 4x - 32 < 0$ (k) $x^2 - 64 \geq 0$ (l) $x^2 - 14x + 48 > 0$

Question 3: Solve the following inequalities

(a) $x^2 - 2x < 15$ (b) $x^2 + 6x > x - 4$ (c) $x^2 < 36$

(d) $x^2 > 121$ (e) $2x^2 - x - 12 \leq x^2 - 2x$ (f) $6x > x^2 - 8x + 40$

(g) $x^2 + 6x < 36 - 10x$ (h) $x^2 + 5x + 1 \geq 7x + 25$

Question 4: Solve the following inequalities

(a) $-x^2 + 8x - 15 < 0$ (b) $-x^2 + 3x + 10 \geq 0$ (c) $-x^2 - 6x - 5 \leq 0$

(d) $18x - x^2 - 32 > 0$ (e) $7x + 44 - x^2 < 0$ (f) $-3x^2 + 4x > -4x^2 + 3x$

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Question 5: Solve the following inequalities

(a) $(2x - 1)(x - 4) < 0$ (b) $(x + 4)(5x + 1) > 0$ (c) $(2x + 7)(x - 8) \leq 0$

(d) $(3x - 2)(x + 1) \leq 0$ (e) $(4x - 3)(2x - 9) > 0$ (f) $(3x + 2)(3x - 5) \geq 0$

Question 6: Solve the following inequalities

(a) $5x^2 + 7x + 2 > 0$ (b) $3x^2 + 8x - 3 < 0$ (c) $2x^2 - 9x + 4 > 0$

(d) $4x^2 - 3x - 1 \geq 0$ (e) $6x^2 - 13x + 7 < 0$ (f) $2x^2 + x - 6 \leq 0$

(g) $4x^2 - 11x + 6 > 0$ (h) $4x^2 - 27x + 18 > 0$ (i) $15x^2 + 4x - 35 < 0$

Apply

Question 1: Tia has attempted her maths homework.
Can you spot any mistakes?

Solve $x^2 - 8x - 33 > 0$

$(x - 11)(x + 3) = 0$
$x = 11$ or $x = -3$

$x > -3$
$x > 11$

Question 2: (a) Solve $x^2 + 6x + 3 = 0$ giving your answers in surd form.

(b) Solve the inequality $x^2 + 6x + 3 < 0$

Question 3: The set of values for x that satisfies a quadratic inequality is $-5 < x < -2$
Write down a possible quadratic inequality.

Question 4: The set of values for x that satisfies a quadratic inequality is $x < -3$ or $x > 6$
Write down a possible quadratic inequality.

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Question 5: Find the set of values of x that satisfy both

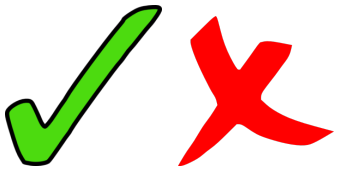
$2x - 6 > 6 - 6x$ and $x^2 - 6x + 2 < 42$

Question 6: The set of values for x that satisfies a quadratic inequality is $x < -0.5$ or $x > 1.5$
Write down a possible quadratic inequality.

Question 7: The width of a rectangular field is x metres.
The length of the field is 30m longer than the width.
The perimeter of the field is less than 500m.
The area of the field is greater than $4000m^2$.

By writing suitable inequalities, find the possible values of x.

Answers



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