



CAMI Mathematics: Grade 11

GRADE 11_ Quadratic inequalities

11.4 Quadratic inequalities

1. Solve the inequalities by using a graph

(a) $3x^2 - 6x - 144 \leq 0$

(b) $-x^2 + 9x - 8 > 0$

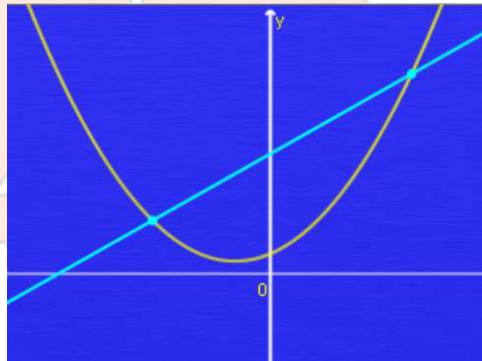
(c) $-2x^2 - 2x + 12 \geq 0$

(d) $-x^2 + x + 6 < 0$

(e) $-x^2 + 3x + 54 > 0$

2. Graph interpretations of inequalities

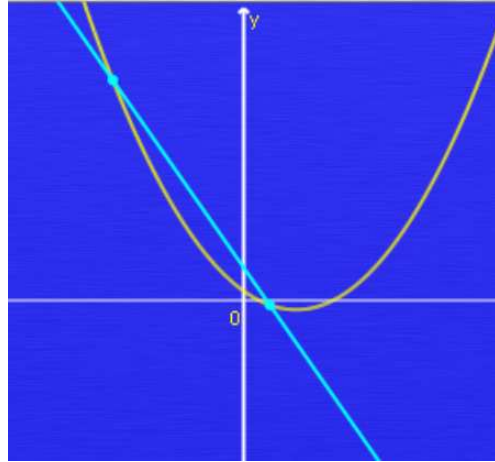
(a) If $f(x) = x^2 + 3x + 6$ and $g(x) = 4x + 36$ are given, determine for which value(s) of x is $f(x) \leq g(x)$.



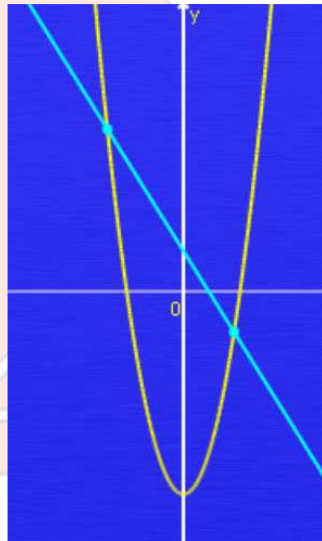
(b) If $f(x) = x^2 - 4x + 2$ and $g(x) = -8x + 7$ are given, determine for which value(s) of x is $f(x) > g(x)$.



CAMI Mathematics: Grade 11



(c) If $f(x) = x^2 - 5$ and $g(x) = -x + 1$ are given, determine for which value(s) of x is $f(x) < g(x)$.

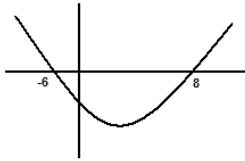




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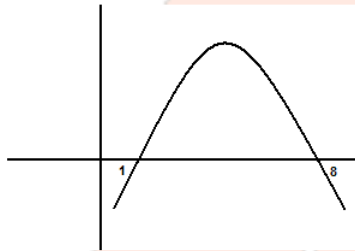
1. Solve the inequalities by using a graph [6.8.2]

(a) $3x^2 - 6x - 144 \leq 0$
 $(x - 8)(x + 6) = 0$
 $x = 8; x = -6$



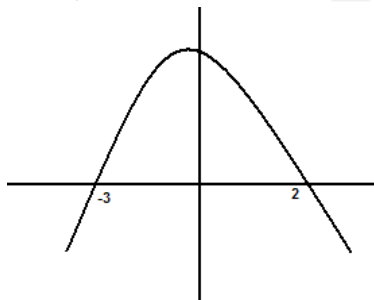
$$\therefore -6 \leq x \leq 8$$

(b) $-x^2 + 9x - 8 > 0$
 $(x - 8)(x - 1) = 0$
 $x = 8; x = 1$



$$\therefore 1 < x < 8$$

(c) $-2x^2 - 2x + 12 \geq 0$
 $(x + 3)(x - 2) = 0$
 $x = -3; x = 2$

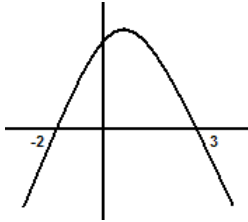


$$\therefore -3 \leq x \leq 2$$



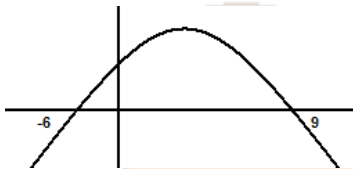
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(d) $-x^2 + x + 6 < 0$
 $(x-3)(x+2) = 0$
 $x = 3; x = -2$



$\therefore x < -2$ or $x > 3$

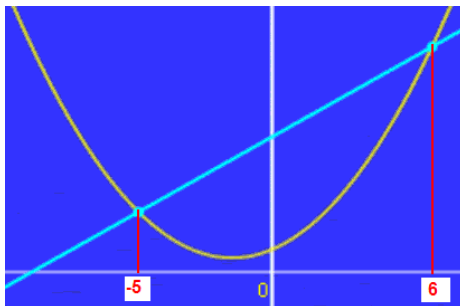
(e) $-x^2 + 3x + 54 > 0$
 $(x-9)(x+6) = 0$
 $x = 9; x = -6$



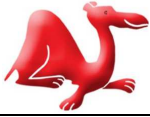
$\therefore -6 < x < 9$

2. Graph interpretations of inequalities [6.8.3.2]

(a) Points of interception:
 $x^2 + 3x + 6 = 4x + 36$
 $x^2 - x - 30 = 0$
 $(x-6)(x+5) = 0$
 $x = 6; x = -5$



$\therefore -5 \leq x \leq 6$



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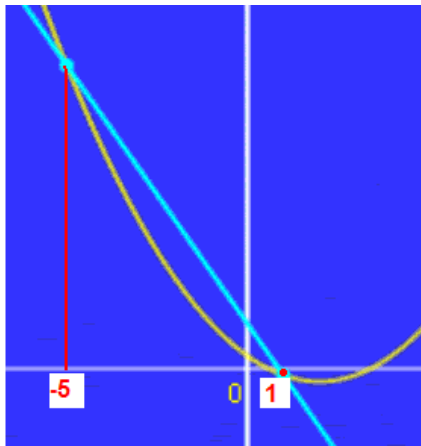
(b) Points of interception:

$$x^2 - 4x + 2 = -8x + 7$$

$$x^2 + 4x - 5 = 0$$

$$(x + 5)(x - 1) = 0$$

$$x = -5; x = 1$$



$$\therefore x < -5 \text{ or } x > 1$$

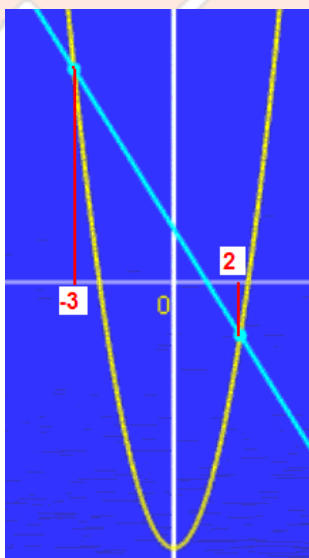
(c) Points of interception:

$$x^2 - 5 = -x + 1$$

$$x^2 + x - 6 = 0$$

$$(x + 3)(x - 2) = 0$$

$$x = -3; x = 2$$



$$\therefore -3 < x < 2$$



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