

Solving Inequalities Graphically

Use the graph to help solve each of these linear and quadratic inequalities.

	(a)	(b)
	$12 - 2x > \frac{1}{2}x + 6$ Point of intersection: $24 - 4x = x + 12$ $12 = 5x$ $x = 2.4$ $(2.4, 7.2)$ $x < 2.4$	$6x - x^2 \leq 12 - 2x$ Points of intersection: $0 = x^2 - 8x + 12$ $0 = (x - 6)(x - 2)$ $x = 6, x = 2$ $(6, 0)$ and $(2, 8)$ $x \leq 2$ or $x \geq 6$
€	(d)	€
$\frac{1}{2}x + 6 \leq 6x - x^2$ Points of intersection: $x + 12 = 12x - 2x^2$ $2x^2 - 11x + 12 = 0$ $(2x - 3)(x - 4) = 0$ $x = \frac{3}{2}, x = 4$ $(1.5, 6.75)$ and $(4, 8)$ $1.5 \leq x \leq 4$	$\frac{1}{4}x^2 + 4 > \frac{1}{2}x + 6$ Points of intersection: $x^2 + 16 = 2x + 24$ $x^2 - 2x - 8 = 0$ $(x - 4)(x + 2) = 0$ $x = 4$ or $x = -2$ $(4, 8)$ and $(-2, 5)$ $-2 < x < 4$ or $x > 4$	$\frac{1}{4}x^2 + 4 \leq 6x - x^2$ Points of intersection: $x^2 + 16 = 24x - 4x^2$ $5x^2 - 24x + 16 = 0$ $(5x - 4)(x - 4) = 0$ $x = 0.8$ or $x = 4$ $(0.8, 4.16)$ and $(4, 8)$ $0.8 \leq x \leq 4$