LINEAR AND QUADRATIC INEQUALITIES — EXERCISE

Solve the following linear inequalities:

1) $7x - 3 > 32$

2) $3x + 7 \leq 8x + 52$

3) $6x - 8 \geq 25 - 4x$

4) $2(x+3) < 9x + 27$

5) $-4x - 5 > -23 - x$

Solve the following quadratic inequalities:

6) $x^2 - 7x + 10 < 0$

7) $x^2 - 12x - 13 > 0$

8) $5 - 4x - x^2 \leq 0$

9) $2x^2 + 7x + 3 \geq 0$

10) $5x^2 - 12x + 4 < 0$

LINEAR AND QUADRATIC INEQUALITIES — EXERCISE

Solutions

1) $7x - 3 > 32$

$7x > 32 + 3$

$7x > 35$

$x > \frac{35}{7}$

$x > 5$

---

2) $3x + 7 \leq 8x + 52$

$3x - 8x \leq +52 - 7$

$-5x \leq 45$

$x \geqslant \frac{45}{-5}$

$x \geqslant -9$

---

3) $6x - 8 \geqslant 25 - 4x$

$6x + 4x \geqslant 25 + 8$

$10x \geqslant 33$

$x \geqslant \frac{33}{10}$

$x \geqslant 3.3$

---

4) $2(x+3) < 9x + 27$

$2x + 6 < 9x + 27$

$2x - 9x < +27 - 6$

$-7x < 21$

$x > \frac{21}{-7}$

$x > -3$

---

5) $-4x - 5 > -23 - x$

$-4x + x > -23 + 5$

$-3x > -18$

$x < \frac{-18}{-3}$

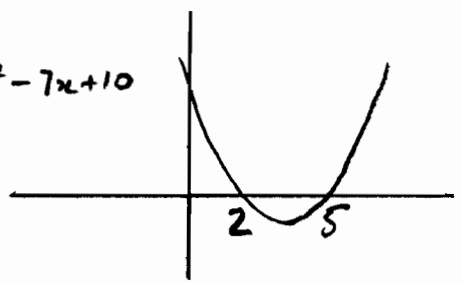
$x < 6$

---

6) $x^2 - 7x + 10 < 0$

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

graph of $y = x^2 - 7x + 10$



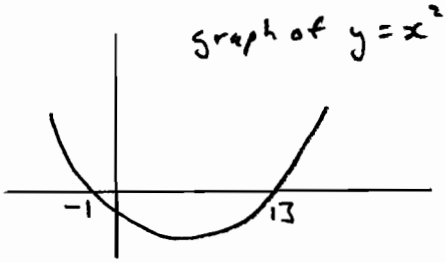
$2 < x < 5$

LINEAR AND QUADRATIC INEQUALITIES — EXERCISE

7) $x^2 - 12x - 13 > 0$

$(x - 13)(x + 1) > 0$

graph of $y = x^2 - 12x - 13$



Either $x > 13$

or $x < -1$

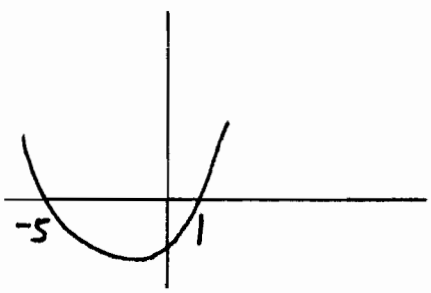
---

8) $5 - 4x - x^2 \leq 0$

$0 \leq x^2 + 4x - 5$

$0 \leq (x + 5)(x - 1)$

graph of $y = x^2 + 4x - 5$



Either $x \geq 1$

or $x \leq -5$

---

9) $2x^2 + 7x + 3 \geq 0$

$2 \times 3 = 6$

Factors adding to 7 are +6 and +1

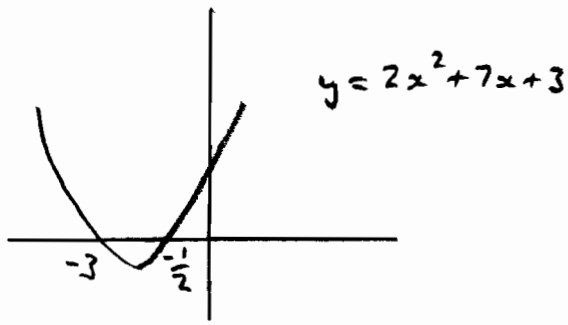
$2x^2 + x + 6x + 3 \geq 0$

$x(2x + 1) + 3(2x + 1) \geq 0$

$(x + 3)(2x + 1) \geq 0$

$y = 0$ when $x = -3$

$y = 0$ when $x = -\frac{1}{2}$



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

or $x < -3$

---

10) $5x^2 - 12x + 4 < 0$

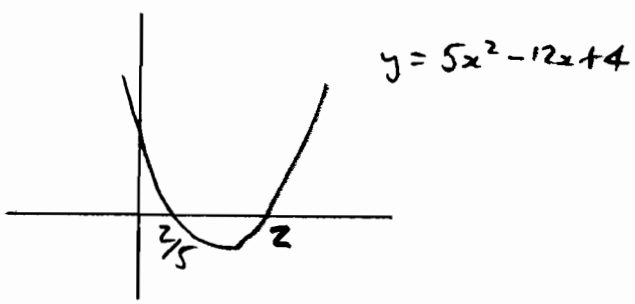
$5 \times 4 = 20$, factors adding to -12 are -2, -10

$5x^2 - 10x - 2x + 4 < 0$

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

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

$y = 0$ when $x = 2$, $y = 0$ when $x = \frac{2}{5}$



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