INEQUALITIES
BASIC PRACTICE

LINEAR INEQUALITIES

Question 1

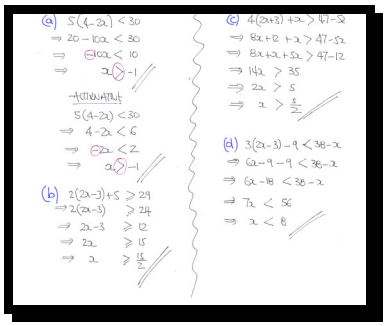
Solve each of the following inequalities.

a) $5(4-2x)<30$ $\boxed{x>-1}$

b) $2(2x-3)+5\geq 29$ $\boxed{x\geq \frac{15}{2}}$

c) $4(2x+3)+x>47-5x$ $\boxed{x>\frac{5}{2}}$

d) $3(2x-3)-9<38-x$ $\boxed{x<8}$



Question 2

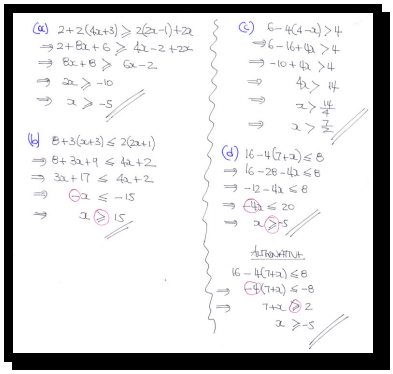
Solve each of the following inequalities.

a) $2+2(4x+3)\geq 2(2x-1)+2x$ $\boxed{x\geq -5}$

b) $8+3(x+3)\leq 2(2x+1)$ $\boxed{x\geq 15}$

c) $6-4(4-x)>4$ $\boxed{x>\frac{7}{2}}$

d) $16-4(7+x)\leq 8$ $\boxed{x\geq -5}$



Question 3

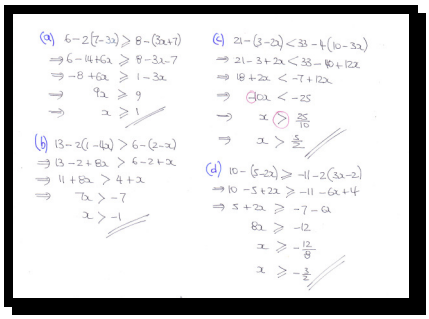
Solve each of the following inequalities.

a) $6-2(7-3x)\geq 8-(3x+7)$ $\boxed{x\geq 1}$

b) $13-2(1-4x)>6-(2-x)$ $\boxed{x>-1}$

c) $21-(3-2x)<33-4(10-3x)$ $\boxed{x>\frac{5}{2}}$

d) $10-(5-2x)\geq -11-2(3x-2)$ $\boxed{x\geq -\frac{3}{2}}$



QUADRATIC INEQUALITIES

Question 1

Solve each of the following quadratic inequalities.

a) $x^2+4x-32>0$

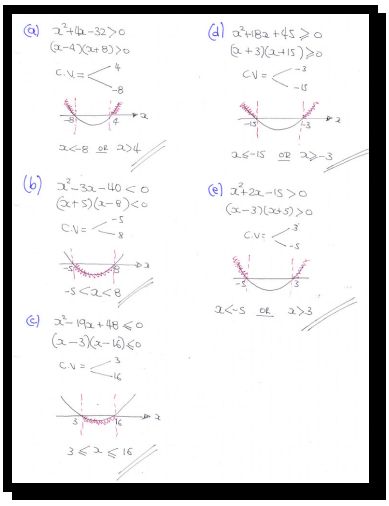
b) $x^2-3x-40<0$

c) $x^2-19x+48\le 0$

d) $x^2+18x+45\ge 0$

e) $x^2+2x-15>0$

$\boxed{x<-8 \text{ or } x>4}$, $\boxed{-5<x<8}$, $\boxed{3\le x\le 16}$, $\boxed{x\le -15 \text{ or } x\ge -3}$, $\boxed{x<-5 \text{ or } x>3}$



Question 2

Solve each of the following quadratic inequalities.

a) $x^2+8x+15\le 0$

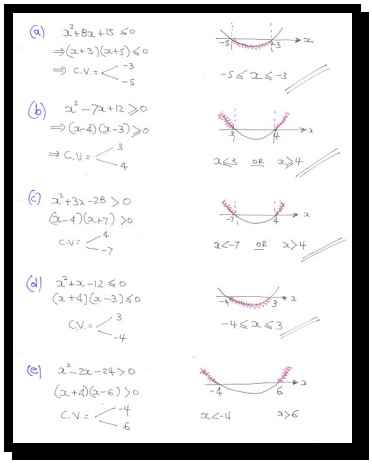
b) $x^2-7x+12\ge 0$

c) $x^2+3x-28>0$

d) $x^2+x-12\le 0$

e) $x^2-2x-24>0$

$\boxed{-5\le x\le -3}$, $\boxed{x\le 3 \text{ or } x\ge 4}$, $\boxed{x<-7 \text{ or } x>4}$, $\boxed{-4\le x\le 3}$, $\boxed{x<-4 \text{ or } x>6}$



Question 3

Solve each of the following quadratic inequalities.

a) $x^2 - 14x + 24 < 0$

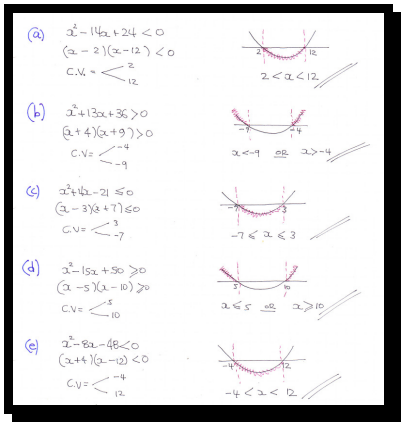
b) $x^2 + 13x + 36 > 0$

c) $x^2 + 4x - 21 \leq 0$

d) $x^2 - 15x + 50 \geq 0$

e) $x^2 - 8x - 48 < 0$

$\boxed{2 < x < 12}$, $\boxed{x < -9 \text{ or } x > -4}$, $\boxed{-7 \leq x \leq 3}$, $\boxed{x \leq 5 \text{ or } x \geq 10}$, $\boxed{-4 < x < 12}$



Question 4

Solve each of the following quadratic inequalities.

a) $x^2+13x-30<0$

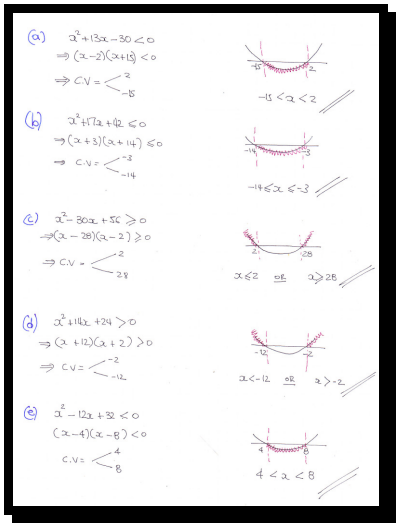
b) $x^2+17x+42\le 0$

c) $x^2-30x+56\ge 0$

d) $x^2+14x+24>0$

e) $x^2-12x+32<0$

$\boxed{-15<x<2}$, $\boxed{-14\le x\le -3}$, $\boxed{x\le 2 \text{ or } x\ge 28}$, $\boxed{x<-12 \text{ or } x>-2}$, $\boxed{4<x<8}$



Question 5

Solve each of the following quadratic inequalities.

a) $2x^2-5x+3>0$

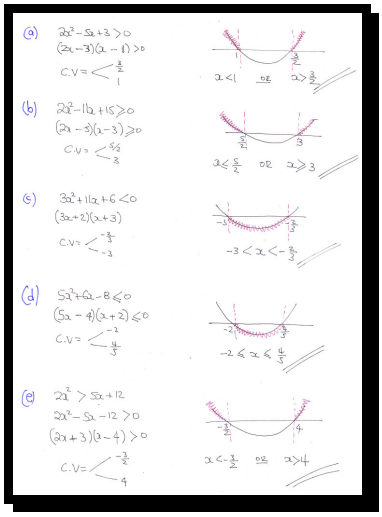
b) $2x^2-11x+15\geq 0$

c) $3x^2+11x+6<0$

d) $5x^2+6x-8\leq 0$

e) $2x^2>5x+12$

$\boxed{x<1 \text{ or } x>\frac{3}{2}}$, $\boxed{x\leq\frac{5}{2} \text{ or } x\geq 3}$, $\boxed{-3<x<-\frac{2}{3}}$, $\boxed{-2\leq x\leq\frac{4}{5}}$, $\boxed{x<-\frac{3}{2} \text{ or } x>4}$



Question 6

Solve each of the following quadratic inequalities.

a) $3x^2+8\le 10x$

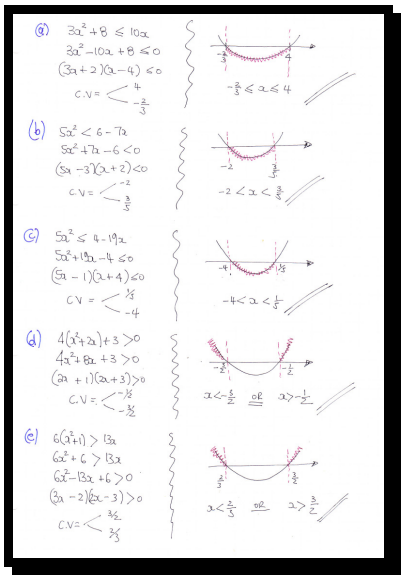
b) $5x^2<6-7x$

c) $5x^2\le 4-19x$

d) $4\left(x^2+2x\right)+3>0$

e) $6\left(x^2+1\right)>13x$

$\boxed{-\frac{2}{3}\le x\le 4}$, $\boxed{-2<x<\frac{3}{5}}$, $\boxed{-4\le x\le\frac{1}{5}}$, $\boxed{x<-\frac{3}{2}\text{ or }x>-\frac{1}{2}}$, $\boxed{x<\frac{2}{3}\text{ or }x>\frac{3}{2}}$



Question 7

Solve each of the following quadratic inequalities.

a) $2x^2 > x + 10$

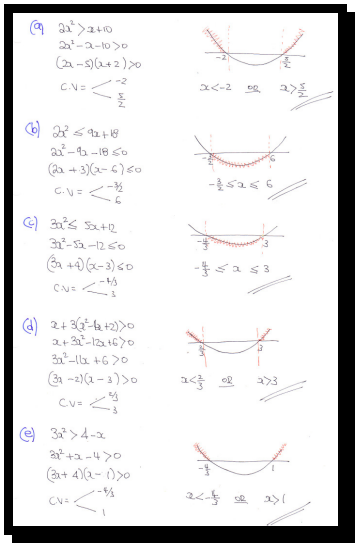
b) $2x^2 \le 9x + 18$

c) $3x^2 \le 5x + 12$

d) $x + 3\left(x^2 - 4x + 2\right) > 0$

e) $3x^2 > 4 - x$

$\boxed{x < -2 \text{ or } x > \frac{5}{2}}$, $\boxed{-\frac{3}{2} \le x \le 6}$, $\boxed{-\frac{4}{3} \le x \le 3}$, $\boxed{x < \frac{2}{3} \text{ or } x > 3}$, $\boxed{x < -\frac{4}{3} \text{ or } x > 1}$



Question 8

Solve each of the following quadratic inequalities.

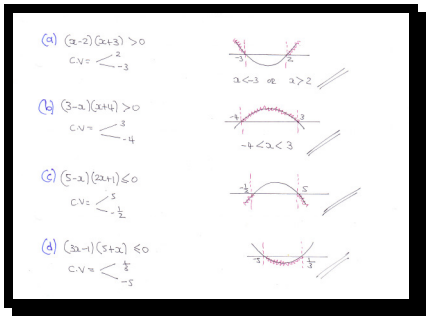
a) $(x-2)(x+3)>0$

b) $(3-x)(x+4)>0$

c) $(5-x)(2x+1)\le 0$

d) $(3x-1)(5+x)\le 0$

$\boxed{x<-3 \text{ or } x>2}$, $\boxed{-4<x<3}$, $\boxed{x\le -\frac{1}{2} \text{ or } x\ge 5}$, $\boxed{-5\le x\le \frac{1}{3}}$



Question 9

Solve each of the following quadratic inequalities.

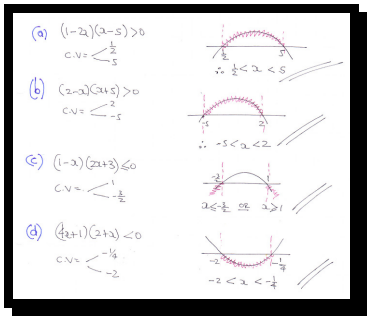
a) $(1-2x)(x-5)>0$

b) $(2-x)(x+5)>0$

c) $(1-x)(2x+3)\le 0$

d) $(4x-1)(2+x)<0$

$\boxed{\frac{1}{2}<x<5}$, $\boxed{-5<x<2}$, $\boxed{x<-\frac{3}{2} \text{ or } x>1}$, $\boxed{-2<x<-\frac{1}{4}}$



Question 10

Solve each of the following quadratic inequalities.

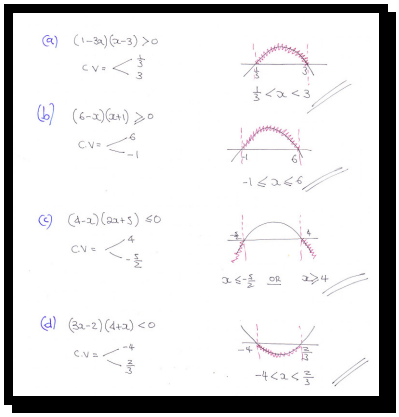
a) $(1-3x)(x-3)>0$

b) $(6-x)(x+1)\geq 0$

c) $(4-x)(2x+5)\leq 0$

d) $(3x-2)(4+x)<0$

$\boxed{\frac{1}{3}<x<3}$, $\boxed{-1\leq x\leq 6}$, $\boxed{x\leq -\frac{5}{2} \text{ or } x\geq 4}$, $\boxed{-4<x<\frac{2}{3}}$



Question 11

Solve each of the following quadratic inequalities.

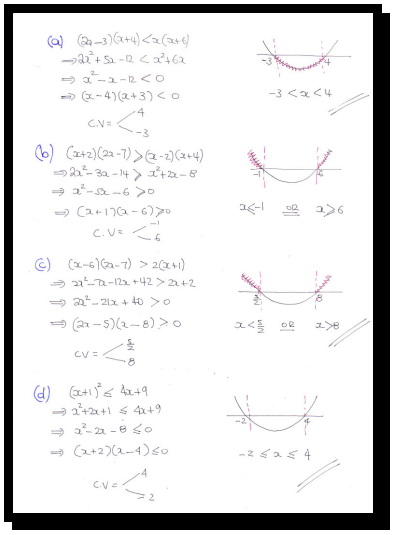
a) $(2x-3)(x+4)<x(x+6)$

b) $(x+2)(2x-7)\geq(x-2)(x+4)$

c) $(x-6)(2x-7)>2(x+1)$

d) $(x+1)^2\leq 4x+9$

$\boxed{-3<x<4}$, $\boxed{x\leq -1 \text{ or } x\geq 6}$, $\boxed{x<\frac{5}{2} \text{ or } x>8}$, $\boxed{-2<x<4}$



Question 12

Solve each of the following quadratic inequalities.

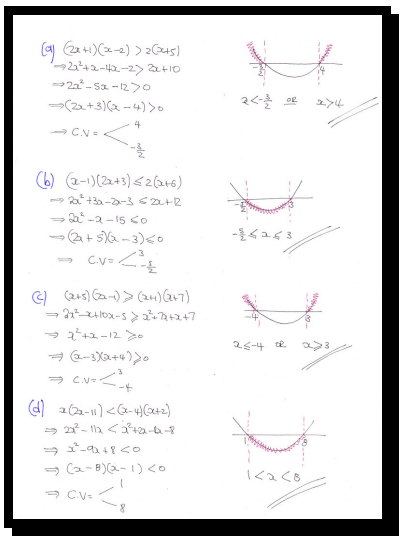
a) $(2x+1)(x-2)>2(x+5)$

b) $(x-1)(2x+3)\le 2(x+6)$

c) $(x+5)(2x-1)\ge (x+1)(x+7)$

d) $x(2x-11)<(x-4)(x+2)$

$\boxed{x<-\frac{3}{2} \text{ or } x>4}$, $\boxed{-\frac{5}{2}\le x\le 3}$, $\boxed{x\le -4 \text{ or } x\ge 3}$, $\boxed{1<x<8}$



Question 13

Solve each of the following quadratic inequalities.

a) $(2x+3)(4x-5)>(2x+5)(2x-1)$

b) $(3x+2)(6x-7)>(3x-2)(3x+4)$

c) $(3x+8)(6x+5)\le(3x+4)(3x+10)$

d) $(2x+3)(x+7)\le(x+3)(x+9)$

$\boxed{x<-1 \text{ or } x>\frac{5}{2}}$, $\boxed{x<-\frac{1}{3} \text{ or } x>2}$, $\boxed{-\frac{7}{3}\le x\le 0}$, $\boxed{-6\le x\le 1}$

