Inequalities

Ex 1

$$2x + 3 = 11$$

$$2x = 11 - 3$$

$$2x = 8$$

$$x = \frac{8}{2}$$

$$x = 4$$

$$2x + 3 < 11$$

$$2x < 11 - 3$$

$$2x < 8$$

$$x < \frac{8}{2}$$

$$x < 4$$

Ex 2

$$8x - 7 = 5x + 11$$

$$8x - 5x = 11 + 7$$

$$3x = 18$$

$$x = \frac{18}{3}$$

$$x = 6$$

$$8x - 7 \geq 5x + 11$$

$$8x - 5x \geq 11 + 7$$

$$3x \geq 18$$

$$x \geq \frac{18}{3}$$

$$x \geq 6$$

Ex 3

$$4x + 1 = 7x + 16$$

$$4x - 7x = +16 - 1$$

$$-3x = 15$$

$$x = \frac{15}{-3}$$

$$4x + 1 \leq 7x + 16$$

$$4x - 7x \leq 16 - 1$$

$$-3x \leq 15$$

$$x \geq \frac{15}{-3}$$

$x = -5$ | $x \geq -5$

Alternative Solution

$4x + 1 = 7x + 16$

$+1 - 16 = 7x - 4x$

$-15 = 3x$

$\frac{-15}{3} = x$

$-5 = x$

$x = -5$

$4x + 1 \leq 7x + 16$

$+1 - 16 \leq 7x - 4x$

$-15 \leq 3x$

$\frac{-15}{3} \leq x$

$-5 \leq x$

$x \geq -5$

Exercise 3D Page 47

1b)

$5x + 4 \geq 39$

$5x \geq 39 - 4$

$5x \geq 35$

$x \geq \frac{35}{5}$

$x \geq 7$

1d)

$5x + 6 \leq -12 - x$

$5x + x \leq -12 - 6$

$6x \leq -18$

$x \leq -\frac{18}{6}$

$x \leq -3$

1f)

$21 - 2x > 8 + 3x$

$-2x - 3x > 8 - 21$

$-5x > -13$

$x < \frac{-13}{-5}$

$x < 2.6$

1j)

$5x + 4 > 12 - 2x$

$5x + 2x > 12 - 4$

$7x > 8$

1h) $7x - 7 < 7 - 7x$

$7x + 7x < 7 + 7$

$14x < 14$

$x < \frac{14}{14}$

$x < 1$

$x > \frac{8}{7}$

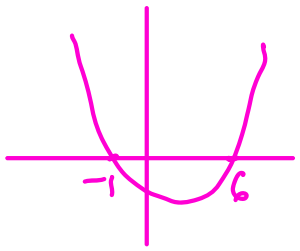
Quadratic Inequalities

Ex1 $x^2 - 5x - 6 < 0$

$(x+1)(x-6) < 0$

$-1 < x < 6$

$y = x^2 - 5x - 6$



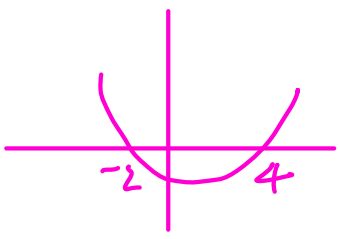
Ex2 $x^2 - 2x - 8 \geq 0$

$(x+2)(x-4) \geq 0$

Either $x \geq 4$

or $x \leq -2$

$y = x^2 - 2x - 8$



Exercise 3E

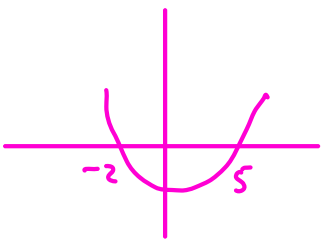
1c) $x^2 - 3x - 10 > 0$

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

Either $x > 5$

or $x < -2$

$y = x^2 - 3x - 10$



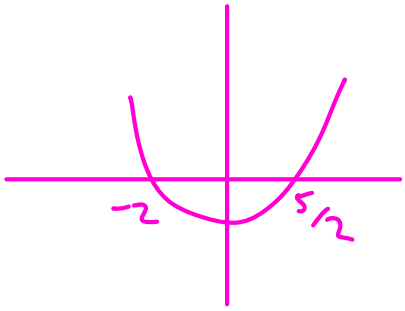
f) $10 + x - 2x^2 < 0$

$0 < 2x^2 - x - 10$

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

Either $x > \frac{5}{2}$

or $x < -2$

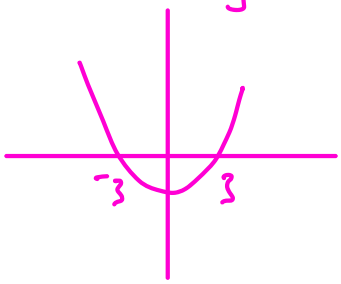


$y = 2x^2 - x - 10$

i) $x^2 - 9 < 0$

$(x+3)(x-3) < 0$

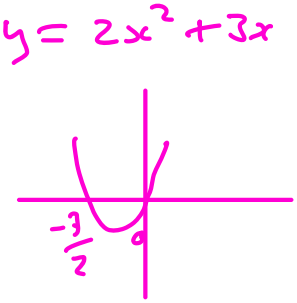
$-3 < x < 3$



l) $2x^2 + 3x \leq 0$

$x(2x+3) \leq 0$

$-\frac{3}{2} \leq x \leq 0$



Homework (for Tuesday)

Exercise 3D Q2 c, f, i, l

Exercise 3E Q1 a, d, g, j

Q2 b, d