

## Section 2: Inequalities

### Solutions to Exercise level 1

1. (i)  $2x + 3 < 10$

$$2x < 7$$

$$x < \frac{7}{2}$$

(ii)  $5x + 3 \geq 2x - 9$

$$3x + 3 \geq -9$$

$$3x \geq -12$$

$$x \geq -4$$

(iii)  $3x - 1 > 7 - x$

$$4x - 1 > 7$$

$$4x > 8$$

$$x > 2$$

(iv)  $4x + 1 \leq 6x - 7$

$$1 \leq 2x - 7$$

$$8 \leq 2x$$

$$4 \leq x$$

$$x \geq 4$$

(v)  $5x + 2 > -7$

$$5x > -9$$

$$x > -\frac{9}{5}$$

(vi)  $3x - 11 \leq 5 + 4x$

$$-16 \leq x$$

$$x \geq -16$$

(vii)  $3(2 - 3x) \geq 5x + 1$

$$6 - 9x \geq 5x + 1$$

$$5 \geq 14x$$

$$x \leq \frac{5}{14}$$

## Edexcel AS Equations & inequalities 2 Exercise solns

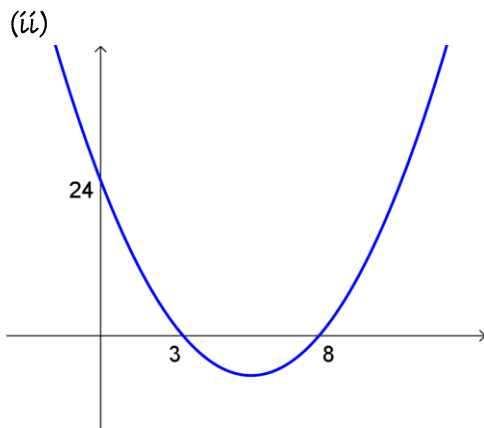
(viii)  $\frac{1}{3}(7+6x) < 2-x$

$$7+6x < 6-3x$$

$$9x < -1$$

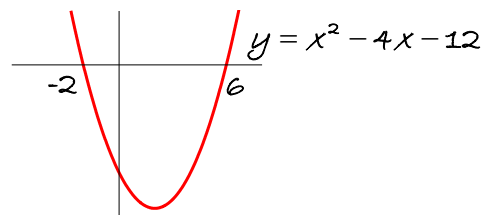
$$x < -\frac{1}{9}$$

2. (i)  $x^2 - 11x + 24 = (x-8)(x-3)$

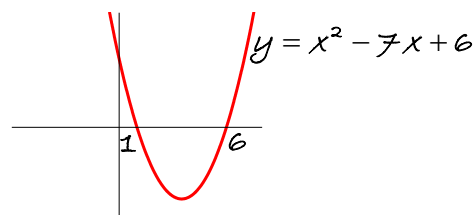


(iii) From the graph,  $x^2 - 11x + 24 \geq 0 \Rightarrow x \leq 3$  or  $x \geq 8$ .

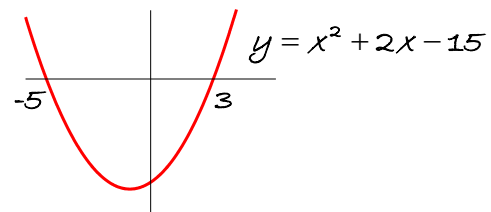
3. (i)  $x^2 - 4x - 12 \leq 0$   
 $(x-6)(x+2) \leq 0$   
From graph,  $-2 \leq x \leq 6$



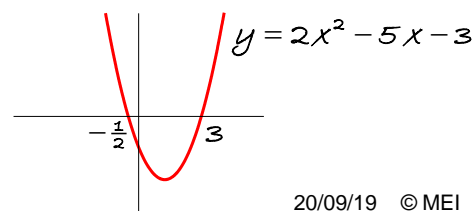
(ii)  $x^2 - 7x + 6 > 0$   
 $(x-1)(x-6) > 0$   
From graph,  $x < 1$  or  $x > 6$



(iii)  $x^2 + 2x - 15 \geq 0$   
 $(x+5)(x-3) \geq 0$   
From graph,  $x \leq -5$  or  $x \geq 3$



(iv)  $2x^2 - 5x - 3 \leq 0$   
 $(2x+1)(x-3) \leq 0$   
From graph,  $-\frac{1}{2} \leq x \leq 3$

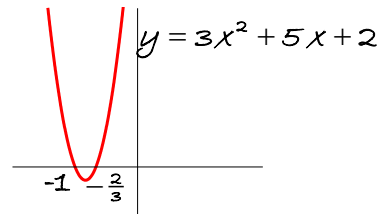


## Edexcel AS Equations & inequalities 2 Exercise solns

(v)  $3x^2 + 5x + 2 < 0$

$(3x+2)(x+1) < 0$

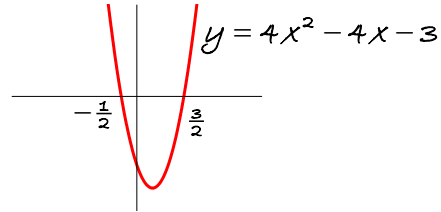
From graph,  $-1 < x < -\frac{2}{3}$



(vi)  $4x^2 - 4x - 3 > 0$

$(2x-3)(2x+1) > 0$

From graph,  $x < -\frac{1}{2}$  or  $x > \frac{3}{2}$



4. (i)  $x > 2$

(ii)  $y \geq 1$

(iii)  $y > x$

(iv)  $y \leq -x + 1$

Since the line is dotted,  
 $x = 2$  is not included in  
the region