

chapter

7

Algebra 3

Section 7.1 Revision

PROJECT MATHS

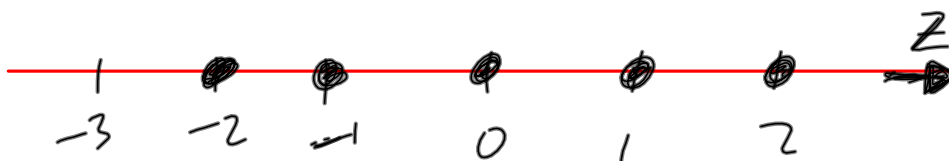
Text & Tests 6

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Example 1

Solve the inequality $3x + 7 \geq x + 2, x \in \mathbb{Z}$, and plot the solution on a number line.

$$\begin{array}{l}
 \text{LHS} \qquad \qquad \text{RHS} \\
 3x + 7 \geq x + 2 \\
 -7, -x \\
 2x \geq -5 \\
 x \geq -\frac{5}{2}
 \end{array}$$



Example 2Solve the inequality $\frac{1}{6}(x-1) \geq \frac{1}{3}(x-4), x \in \mathbb{R}$.

Graph your solution on a number line.

$x6$
 $-x, +8$
 write x first

graph
 $x \in \mathbb{R}$

$$\begin{aligned} x-1 &\geq 2x-8 \\ 7 &\geq x \\ x &\leq 7 \end{aligned}$$

**Example 3**Solve the inequality $-9 < 3 - 4x \leq 1, x \in \mathbb{R}$.

Graph your solution on the number line.

We want to
 get x in
 the middle

$\div -4$
 *Change
 direction
 of
 inequality when
 signs change

Write small
 no. first

graph
 $x \in \mathbb{R}$

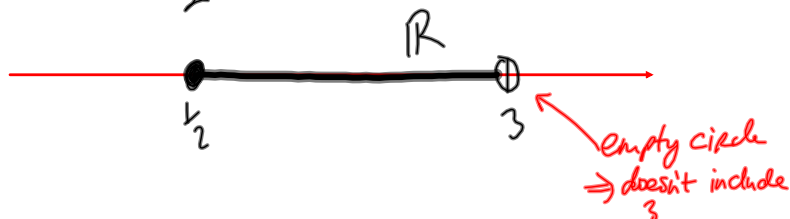
$$\begin{array}{ccc} \text{LHS} & \text{MIDDLE} & \text{RHS} \\ -9 & < & 3 - 4x \leq 1 \\ -3 & & -3 \end{array}$$

$$-12 < -4x \leq -2$$

$$\frac{-12}{-4} > x \geq \frac{-2}{-4}$$

$$3 > x \geq \frac{1}{2}$$

$$\frac{1}{2} \leq x < 3$$



Example 4

- (i) Find the solution set A , $\{x \mid 7 \leq 10 - 3x, x \in R\}$.
 (ii) Find the solution set B , $\{x \mid 2 > \frac{4}{3} - 2x, x \in R\}$.
 (iii) Find the set $A \cap B$ and graph the solution on the number line.

$$\begin{array}{l|l}
 7 \leq 10 - 3x & 2 > \frac{4}{3} - 2x \\
 -3 \leq -3x & 6 > 4 - 6x \\
 1 \geq x & 2 > -6x \\
 x \leq 1 & -\frac{1}{3} < x \\
 & x > -\frac{1}{3} \\
 \hline
 & -\frac{1}{3} < x \leq 1
 \end{array}$$

2. Solve each of the following inequalities and plot the solution set on a number line.

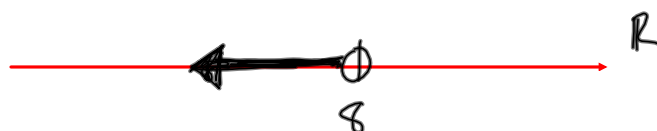
(iii) $\frac{4-x}{2} > \frac{2-x}{3}, x \in R$

$$3(4-x) > 2(2-x)$$

$$\begin{array}{r}
 \cancel{12} - 3x > \cancel{4} - 2x \\
 \cancel{-12} \quad +2x \quad \quad \quad \cancel{-12} + 2x
 \end{array}$$

$$-x > -8$$

$$x < 8$$



5. Solve each of the following inequalities, $x \in \mathbb{R}$.

(i) $3 > \frac{3}{5}(x - 2) > 0$

(ii) $-4 \leq \frac{2}{5}(1 - 3x) \leq 1$

(iii) $3 \leq 2 - \frac{x}{7} < 4$

$$-4 \leq \frac{2}{5}(1 - 3x) \leq 1$$

$\times 5$

$$-20 \leq 2 - 6x \leq 5$$

-2

$$-22 \leq -6x \leq 3$$

$\div -6$

$$\frac{11}{3} \geq x \geq -\frac{1}{2}$$

Small 1st

$$-\frac{1}{2} \leq x \leq \frac{11}{3}$$

graph
 $x \in \mathbb{R}$

