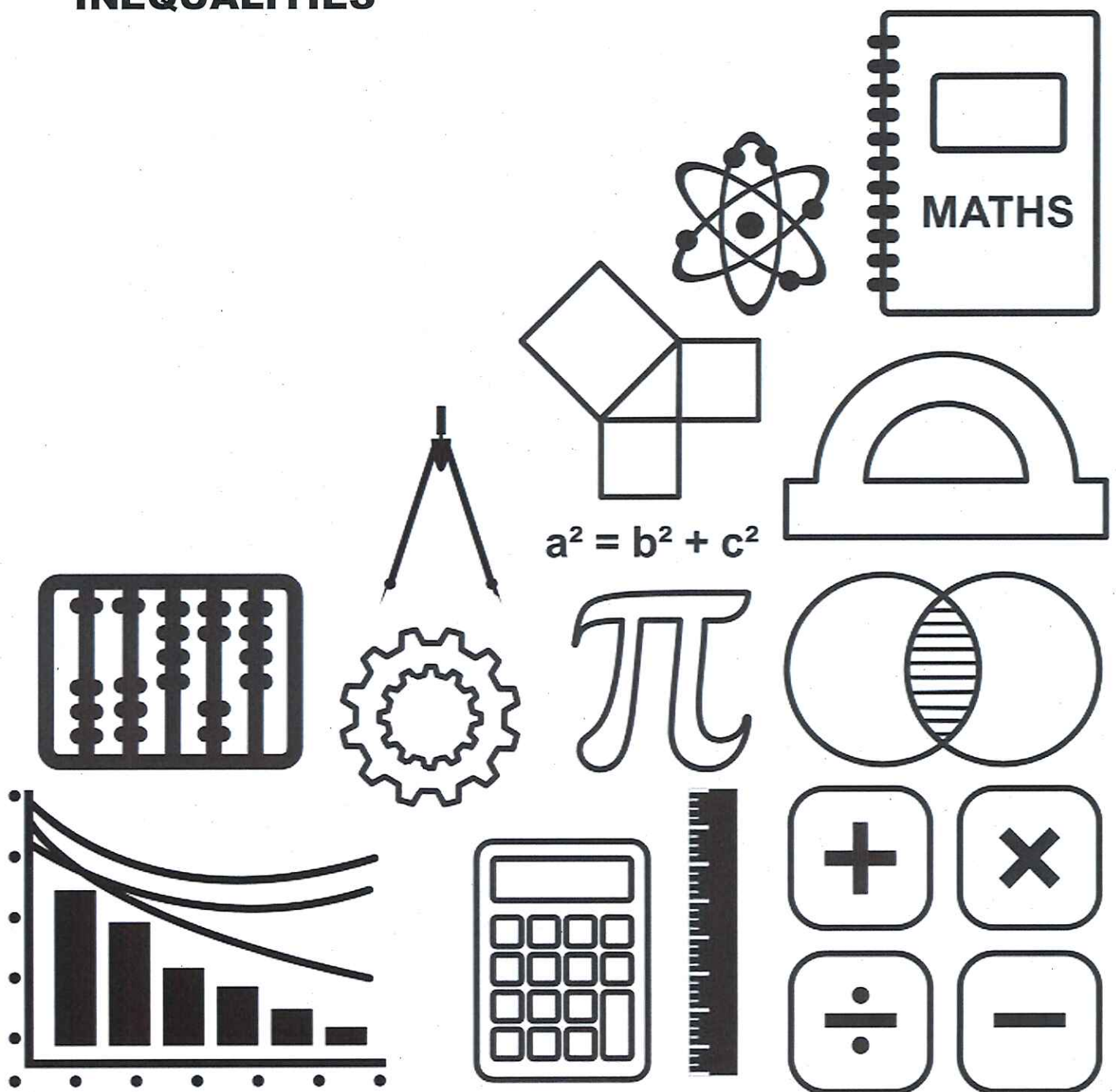


MATHSDIY

GCSE TOPIC BOOKLET INEQUALITIES

SOLUTIONS



1. Use either symbol $<$ or $>$ in order to make each statement true.

$$2 \dots\dots\dots 9$$

$$10 \dots\dots\dots -1$$

$$-5 \dots\dots\dots -7$$

(2)

2. Solve the inequality

$$3 - x < 7. \quad (+x)$$

$$3 < 7 + x \quad (-7)$$

$$3 - 7 < x$$

$$\underline{-4 < x} \quad (\text{or } \underline{x > -4})$$

(2)

3. Solve the inequality

$$3x - 4 < 26. \quad (+4)$$

$$3x < 26 + 4$$

$$3x < 30 \quad (\div 3)$$

$$x < 30/3$$

$$\underline{x < 10}$$

(2)

4. Solve the inequality

$$10x + 5 > 45. \quad (-5)$$

$$10x > 45 - 5$$

$$10x > 40 \quad (\div 10)$$

$$x > 40/10, \quad \underline{x > 4}$$

(2)

5. Solve the inequality

$$5x - 22 < 188. \quad (+22)$$

$$5x < 188 + 22$$

$$5x < 210 \quad (\div 5)$$

$$x < 210/5, \quad \underline{\underline{x < 42}}$$

(2)

6. Solve the inequality

$$10x + 8 < 42. \quad (-8)$$

$$10x < 34 \quad (\div 10)$$

$$x < 34/10$$

$$\underline{\underline{x < 3.4}}$$

(2)

7. Solve the inequality

$$6x + 5 < 47. \quad (-5)$$

$$6x < 42 \quad (\div 6)$$

$$x < 42/6$$

$$\underline{\underline{x < 7}}$$

(2)

8. Solve the inequality

$$2x + 3 > 35. \quad (-3)$$

$$2x > 35 - 3$$

$$2x > 32 \quad (\div 2)$$

$$x > 32/2$$

$$\underline{\underline{x > 16}}$$

(2)

9. Solve the inequality

$$3b + 2 > 29. \quad (-2)$$

$$3b > 27 \quad (\div 3)$$

$$b > 27/3$$

$$\underline{\underline{b > 9}}$$

(2)

10. Solve the inequality

$$6x + 4 < 100. \quad (-4)$$

$$6x < 96 \quad (\div 6)$$

$$x < 96/6$$

$$\underline{\underline{x < 16}}$$

(2)

11. Solve the inequality

$$9x + 5 < 77. \quad (-5)$$

$$9x < 72 \quad (\div 9)$$

$$x < 72/9$$

$$\underline{\underline{x < 8}}$$

(2)

12. Write down the greatest whole number that satisfies the inequality

$$78x < 845. \quad (-78)$$

$$x < \frac{845}{78}$$

$$x < 65/6$$

$$\underline{\underline{x < 10\frac{5}{6}}}$$

Greatest whole number is 10

(2)

13. Write down the smallest whole number that satisfies the inequality

$$6x > 62 \quad (\div 6)$$

$$x > \frac{62}{6}, \quad x > 10\frac{1}{3}$$

Smallest whole number is 11

(2)

14. Write down the greatest whole number that satisfies the inequality

$$3x < 81 \quad (\div 3)$$

$$x < 8\frac{1}{3}, \quad x < 27$$

Greatest whole number is 26

(2)

15. a) Rearrange the inequality

$$35 - 3n > 2n + 7 \quad (+3n)$$

$$35 > 5n + 7 \quad (-7)$$

into the form $n < \text{some number}$.

$$28 > 5n \quad (\div 5)$$

$$\frac{28}{5} > n$$

$$5.6 > n, \quad \text{or} \quad n < 5.6$$

(2)

- b) Given that n also satisfies the inequality $3n > 1$, write down all the integer values of n that satisfy both inequalities

$$3n > 1 \quad (\div 3)$$

$$n > \frac{1}{3}$$

1, 2, 3, 4, 5

(2)

16. Find all the integer values of n that satisfy the inequality.

$$5 \leq 3n \leq 18$$

$$5 \leq 3n \quad (\div 3) \quad \text{and} \quad 3n \leq 18 \quad (\div 3)$$

$$\frac{5}{3} \leq n$$

$$n \leq \frac{18}{3}$$

$$n \leq 6$$

$$2, 3, 4, 5, 6$$

(3)

17. Find all the integer values of n that satisfy the inequality.

$$6 \leq 2n \leq 13$$

$$6 \leq 2n$$

and

$$2n \leq 13$$

$$3 \leq n$$

$$n \leq 6.5$$

$$3, 4, 5, 6$$

(3)

18. Find all the integer values of n that satisfy the inequality.

$$-8 \leq 3n \leq 6$$

$$-8 \leq 3n$$

and

$$3n \leq 6$$

$$-\frac{8}{3} \leq n$$

$$n \leq \frac{6}{3}$$

$$-2\frac{2}{3} \leq n$$

$$n \leq 2$$

$$-2, -1, 0, 1, 2$$

(3)

19. a) The inequality

$$7 - 3n < 12 - 5n$$

can be rearranged into one of the following forms:

EITHER the form $n < a \text{ number}$

OR the form $n > a \text{ number}$

Rearrange the inequality into whichever form is correct.

(+5n)

$$7 + 2n < 12 \quad (-7)$$

$$2n < 5 \quad (\div 2)$$

$$n < 5/2$$

$$\underline{\underline{n < 2.5}}$$

(2)

- b) Write down the least or greatest whole number value of n which satisfies your inequality. State whether it is the least or the greatest.

Greatest whole number value of n

$$\underline{\underline{n = 2}}$$

(2)

20. Anwar went shopping to buy a book and some CDs.

He had exactly £60 with him.

In one shop, he bought a book costing £15 and some CDs.

Each CD cost £7.

When he paid for these items, he was given some change.

Anwar bought n CDs.

Write down an inequality which is satisfied by n .

What is the greatest number of CDs Anwar could have bought?

$$7n + 15 < 60 \quad (-15)$$

$$7n < 60 - 15$$

$$7n < 45 \quad (\div 7)$$

$$n < 45/7$$

$$\underline{\underline{n < 6\frac{3}{7}}}$$

Greatest number of CDs = 6.

(4)