

GCSE Maths: Double inequalities and whole-number solutions (Higher): answers

GCSE Maths - Inequalities - Higher - Lesson 10.5

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch10-inequalities/higher/double-inequalities-and-whole-number-solutions/

Exercise 10F Double inequalities and integer solutions Non-calculator

1 n is an integer. Write down all the values of n that satisfy each inequality.

(a) $-3 \leq n < 2$

Answer: $-3, -2, -1, 0, 1$

(b) $1 < n \leq 6$

Answer: $2, 3, 4, 5, 6$

(c) $-5 < n < -1$

Answer: $-4, -3, -2$

(d) $0 \leq n \leq 4$

Answer: $0, 1, 2, 3, 4$

(e) $-2.5 < n \leq 1.5$

Answer: $-2, -1, 0, 1$

(f) $-1 < n < 1$

Answer: 0

2 Solve each double inequality.

(a) $4 < 2x \leq 12$

Answer: $2 < x \leq 6$

(b) $-3 \leq x + 1 < 5$

Answer: $-4 \leq x < 4$

(c) $6 < 3x \leq 15$

Answer: $2 < x \leq 5$

(d) $1 \leq 2x - 5 < 9$

Answer: $3 \leq x < 7$

(e) $0 < 5x + 10 \leq 40$

Answer: $-2 < x \leq 6$

(f) $-7 < 2x - 1 \leq 3$

Answer: $-3 < x \leq 2$

3 x is an integer. Solve each inequality and list the possible values of x .

(a) $3 < 2x + 1 \leq 11$

Answer: 2, 3, 4, 5

(b) $-4 \leq 3x - 1 < 11$

Answer: -1, 0, 1, 2, 3

(c) $2 \leq 4x - 2 < 18$

Answer: 1, 2, 3, 4

(d) $-6 < 2x \leq 6$

Answer: -2, -1, 0, 1, 2, 3

4 n is an integer. How many values of n satisfy $-2 < n \leq 3$?

Answer: 5

5 The number line shows the integer values of n that work.



Write down the integers, and an inequality for n .

Answer: -3, -2, -1, 0, 1; $-3 \leq n < 2$

6 x is an integer, $2x - 1 > 5$ and $x < 7$. List all the possible values of x .

Answer: 4, 5, 6

7 x is an integer, $3x - 2 \geq 4$ and $2x + 1 < 11$. List all the possible values of x .

Answer: 2, 3, 4

8 A rectangle has width 4 cm and length $(x + 2)$ cm. Its area is more than 24 cm^2 and at most 40 cm^2 . This means $24 < 4(x + 2) \leq 40$, which is $24 < 4x + 8 \leq 40$. If x is a whole number, write down the possible values of x .

Answer: 5, 6, 7, 8

9 A taxi costs £3 plus £2 for every whole mile, so a journey of m miles costs $(2m + 3)$ pounds. Ellie pays at least £9 and at most £21. Write down all the possible values of m .

Answer: 3, 4, 5, 6, 7, 8, 9

10 How many integers satisfy $-7 < 2x + 1 \leq 9$?

Answer: 8

11 Ali solves $2 < 3x - 1 < 11$ and gets $\frac{1}{3} < x < \frac{10}{3}$. Explain his mistake and give the correct answer.

Answer: $1 < x < 4$. He subtracted 1 instead of adding 1

12 Explain why the only integer n satisfying $-1 < n < 1$ is 0.

Answer: The only whole number between -1 and 1, not including them, is 0

13 n is an integer with $n^2 < 30$ and $2n + 3 \geq -5$. List all the possible values of n .

Answer: $-4, -3, -2, -1, 0, 1, 2, 3, 4, 5$

14 Solve each double inequality.

(a) $7 < -2x + 3 \leq 11$

Answer: $-4 \leq x < -2$

(b) $-4 \leq -3x + 5 < 8$

Answer: $-1 < x \leq 3$

(c) $2 < -x + 1 \leq 6$

Answer: $-5 \leq x < -1$

(d) $-9 \leq -4x + 3 < 0$

Answer: $0.75 < x \leq 3$

15 x is an integer. Solve $-3 \leq 1 - 2x < 9$ and list the possible values of x .

Answer: $-3, -2, -1, 0, 1, 2$