

CHALLENGING FIRST ORDER INEQUALITIES

CANSU OLCE

A STAR MATHS (www.astarmaths.com.au)

1. $9 \leq \frac{2x-3}{7} \leq 13$

Find x .

2. $x \in \mathbb{Z}$
 $4x - 5 < 5x + 2 < 2x + 3$

Find sum of possible x values.

3. $x \in \mathbb{Z}$
 $3x - 1 < 2x + 4 < x - 2$

Find $\max(x)$.

4. $y \in \mathbb{Z}$
 $3 < x < 8$
 $2x + y = 10$

Find sum of possible y values.

5. $x \in \mathbb{Z}$
 $\left(\frac{16}{9}\right)^{2x-4} > \left(\frac{3}{4}\right)^{x-2}$

Find $\min(x)$.

6. $(x-2y) \in \mathbb{Z}$

$$3 < x < 7$$

$$-1 < x < 6$$

Find $\max(x-2y)$.

7. $y \in \mathbb{Z}$

$$x^2 < x$$

$$y = 3x - 4$$

Find $\max(y)$.

8. $\frac{x^2+1}{x-3} < 0$

Find x .

9. $x, y, z \in \mathbb{Z}$

$$x + y > 4$$

$$x + z < 5$$

$$y + z > 3$$

$\min(y) = ?$

10. $x, y \in \mathbb{Z}$

$$3 < x < 4$$

$$1 < x < 5$$

Find $\min(2x - y)$.

11. $(2x - y) \in \mathbb{Z}$
 $-3 < x < 4$
 $1 < y < 5$
 Find $\min(2x - y)$.

12. $x \in \mathbb{Z}$
 $\frac{x - 5}{2} - \frac{2x + 4}{4} < x - \frac{2x - 1}{3}$
 $\min x$.

13. $(x \cdot y) \in \mathbb{Z}$
 $-5 < x < 4$
 $-6 < y < 6$
 Find $\min(x \cdot y) + \max(x \cdot y)$

14. $x, y \in \mathbb{Z}$
 $-2 < x \leq 3$
 $-6 < y \leq 4$
 Find $\max(2x + y)$.

15. $(a^3 + b^2) \in \mathbb{Z}$
 $-2 < a < 3$
 $-3 < b < 1$
 Find $\max(a^3 + b^2)$.

ANSWER KEY

1. [33,47)
 2. -21
 3. -7
 4. -9
 5. 3
 6. 8
 7. -2
 8. $(-\infty, 3)$
 9. 2
 10. -8
 11. -10
 12. -11
 13. 0
 14. 10
 15. 35