

Inequalities

Foundation to Challenge

Practice should make the test feel easier, not merely familiar.

Work without the answer key first. Check answers through the SAT Practice Library after completing the set.

FOUNDATION

- 1** If n is an integer and $5(n-3) > -2(n-11)$, what is the least possible value of n ?

- 2** For $4x - 5 \leq 2x + 9$, which choice is NOT a solution?

- A. 1
- B. 4
- C. 7
- D. 9

- 3** For $7b - 3 \geq 9 - 5b$, which choice is NOT a solution?

- A. -2
- B. 1
- C. 4
- D. 9

STANDARD

- 4** A point lies in the solution set of $y \geq -x + 7$ and $y > 2x - 5$. Which point could lie in the solution set?

- A. (1, 4)
- B. (3, 3)
- C. (4, 2)
- D. (5, 8)

- 5 If $(1, 18)$ satisfies $y > 12x + a$ and $y < 4x + b$, which of the following could be $b - a$?
- A. 4
 - B. 6
 - C. 8
 - D. 10

STANDARD

- 6 Which inequality gives all possible values of x if $-3(2x - 5) > 4x - 15$?
- A. $x < 3$
 - B. $x > 3$
 - C. $x < 5$
 - D. $x > 5$

- 7 If $4r + 9 \leq r - 6$, what is the greatest possible value of $3r + 2$?

- 8 If $k \leq x \leq 2k + 10$, which statements must be true? I. $x - 10 \leq 2k$ II. $k \geq -10$ III. $x - k \geq 0$
- A. I only
 - B. I and II only
 - C. II and III only
 - D. I, II and III

ADVANCED

- 9 If $a < b$, which statements must be true? I. $a^2 < b^2$ II. $3a < 3b$ III. $-b < -a$
- A. I only
 - B. II only
 - C. II and III only
 - D. I, II and III

- 10** Which inequality gives all values of b satisfying $\frac{8-2b}{4} > 3$?
- A. $b < -2$
 - B. $b > -2$
 - C. $b < 2$
 - D. $b > 2$

STANDARD

- 11** If (p,q) satisfies $y \leq -x + 6$ and $y \geq 2x - 3$, what is the maximum possible value of p ?
- A. 2
 - B. 3
 - C. 4
 - D. 5

ADVANCED

- 12** If (p,q) satisfies $y \geq -2x + 4$ and $y \geq x - 5$, what is the minimum possible value of q ?
- A. -4
 - B. -2
 - C. 0
 - D. 2

STANDARD

- 13** How many real solutions does $-5(4x+3) \geq 3(5-7x) + x$ have?
- A. Zero
 - B. One
 - C. Two
 - D. Infinitely many

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How many real solutions does $\left(\frac{1}{2}\right)(3x+4)+x \geq \left(\frac{5}{2}\right)x+2$ have?

- A. Zero
- B. One
- C. Two
- D. Infinitely many

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How many real solutions does $\left(\frac{1}{3}\right)(4x-6)+x < \left(\frac{7}{3}\right)x-2$ have?

- A. Zero
- B. One
- C. Two
- D. Infinitely many

FOUNDATION

16

A cafe wants to sell at least 120 muffins and cookies in a day. If c is cookies and m is muffins, which inequality models the goal?

- A. $c+m \leq 120$
- B. $c+m \geq 120$
- C. $c+m < 120$
- D. $c+m = 120$

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A student can spend no more than 12 hours on math and science this week. If x and y are the hours, which inequality models the condition?

- A. $x+y \geq 12$
- B. $x+y \leq 12$
- C. $x+y > 12$
- D. $x+y < 12$

18

A family has a budget of \$640 for meals and entertainment. If m and e are the two costs, which inequality keeps spending within budget?

- A. $m+e \leq 640$
- B. $m+e \geq 640$
- C. $m+e < 640$
- D. $m+e > 640$

STANDARD

- 19 A workshop must make at least 80 wooden frames, and the number of frames w must be at least three times the number of glass panels g . Which pair models this?

A. $w \geq 80$ and $w \geq 3g$
B. $w \leq 80$ and $w \geq 3g$
C. $w \geq 80$ and $w \leq 3g$
D. $w \leq 80$ and $w \leq 3g$

- 20 A factory must make at least 90 total units u and v . Unit u costs \$4 and unit v costs \$7, with total cost at most \$500. Which system models this?

A. $u + v \geq 90$ and $4u + 7v \leq 500$
B. $u + v \geq 90$ and $7u + 4v \leq 500$
C. $u + v \leq 90$ and $4u + 7v \leq 500$
D. $u + v \geq 90$ and $4u + 7v \geq 500$

- 21 A rectangular garden must have area at least 280 m^2 and perimeter at least 68 m . Which system models length x and width y ?

A. $xy \geq 280$ and $x + y \geq 34$
B. $xy \geq 280$ and $x + y \geq 68$
C. $xy \geq 140$ and $x + y \geq 34$
D. $xy \geq 140$ and $x + y \geq 68$

ADVANCED

- 22 A jar has black, white, and green beads. The number of green beads is greater than half the number of black beads, and the number of white beads is less than twice the number of black beads. If there are 40 green beads, what is the greatest possible number of white beads?

- 23** A deck has 60 red and black cards total. The number of red cards is less than three times the number of black cards. What is the minimum possible number of black cards?

- 24** A shipping company used 300 small, medium, and large boxes. Exactly 90 were medium. The number of large boxes was greater than the total number of small and medium boxes. What is the greatest possible number of small boxes?

CHALLENGE

- 25** A hall seats at least 176 people using short tables seating 4 and long tables seating 8. No more than 30 tables may be used. What is the greatest number of short tables possible?
- A. 8
 - B. 12
 - C. 16
 - D. 20

- 26** Lina decorates two-layer cakes in 18 minutes and three-layer cakes in 30 minutes. She must finish at least 16 cakes in at most 6 hours. What is the greatest number of three-layer cakes she can make?
- A. 3
 - B. 4
 - C. 5
 - D. 6

FINISHED?

Check your answers online

aryalanupme.github.io/sat-inequalities.html

Do not stop at “wrong.” Identify why it was wrong: concept, algebra, arithmetic, interpretation, calculator choice, or timing.

I do not correct the answer first. I correct the reason.

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