

1

$$3x - 1 = \sqrt{3k^2 - x}$$

If $k > 0$ and $x = 2$ in the equation above, what is the value of k ?

(Grid in) $3(2) - 1 = \sqrt{3k^2 - 2}$

shift
solve

3

2

$$\sqrt{x-7} = 7^2$$

What value of x satisfies the given equation?

- A) 0
- B) 14
- C) 42
- D) 56

shift
solve

$$x - 7 = 49 + 7$$

$$x = 49 + 7$$

$$x = 56$$

3

$$\sqrt{k+2} - x = 0$$

In the equation above, k is a constant. If $x = 9$, what is the value of k ?

- A) 1
- B) 7
- C) 16
- D) 79

shift
solve

or

$$\sqrt{k+2} - 9 = 0$$

$$\sqrt{k+2} = 9^2$$

$$k+2 = 81$$

$$k = 81 - 2$$

$$79$$



Basics

Equations Part C

1

The solution set of the equation

$\sqrt{2x+1} - x = -1$ is:

- ~~A.~~ $\{0, 1, 4\}$ $\sqrt{2(1)+1} - 1$
~~B.~~ $\{1, 4\}$ $\sqrt{3} - 1$
C. $\{4\}$
~~D.~~ $\{0\}$

2

$x - 2 = \sqrt{x + 10}$

Which of the following values of x is a solution to the equation above?

- A) -1
 B) 1
 C) 4
D) 6

3

Which of the following is a solution to the equation

$\sqrt{14-x} + 2 = x$?

- ~~I.~~ -2 $\sqrt{14-(-2)} + 2 = -2$ $\times \times$
~~II.~~ 1
III. 5
~~A.~~ I only
~~B.~~ II only
C. III only
~~D.~~ I and III



Basics

Inequalities (Solve)

$$2x + 1 \geq 5$$

$$2x \geq \frac{4}{2}$$

$$x \geq 2$$

$$2x + 1 = 5$$

$$2x = \frac{4}{2}$$

$$x = 2$$

$$3 \leq 2x - 1 < 9$$

$$\frac{4}{2} \leq 2x < \frac{10}{2}$$

$$2 \leq x < 5$$

$$1 - x < 9$$

$$-x < 8$$

$$x > \frac{8}{-1}$$

$$x > -8$$

$\times$
÷
-ve → Change



1

Among the following ordered pairs, which one is a solution of the system

$$\begin{cases} y > x \\ y \leq -x \end{cases} ?$$

- A. $(-1, 0)$
 B. $(0, -1)$
 C. $(-1, 2)$
 D. $(0, 1)$

$0 > -1$ ✓
 $0 \leq +1$ ✓

785

3

Among the following ordered pairs, which one is a solution of the system

$$\begin{cases} y < x \\ y > x-2 \end{cases} ?$$

- B. $(1, 1)$
 A. $(2, 1)$
 C. $(4, 1)$
 D. $(1, 4)$

2

If $3 < 2x + 7 \leq 15$, which of the following integers represents the **smallest** value for $x + 3$?

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

$$-\frac{4}{2} < 2x \leq \frac{8}{2}$$

$$-2 < x \leq 4$$

$-1, 0, 1, 2, 3, 4$

$x + 3$
 $-1 + 3 = 2$

4

If $2 < 3x - 1 < 11$ which of the following integers represents the **Greatest** value of $x + 2$?

- A. 3
 B. 4
 C. 5
 D. 6



Basics

Inequalities (Solve)

1

If $2z - 7(z - 1) \leq 1$ and z is an integer, what is the least possible value of z ?

- ~~A. -2~~ $2(-2) - 7(-2-1) = 17 \leq 1$ ✗
~~B. 0~~ $2(0) - 7(0-1) = 7 \leq 1$ ✗
C. 2 $2(2) - 7(2-1) = -3 \leq 1$ ✓
 D. 4

3

Which of the following numbers is NOT a solution of the inequality $3x - 5 \geq 4x - 3$?

- A. -1
 B. -2
 C. -3
 D. -5

2

$$-3 < 2x - y \leq 14$$

78E Which point could be the solution for the inequality above?

- ~~A. (0, 3)~~ $2(0) - (3) = -3$
~~B. (4, -8)~~ $2(4) - (-8) = 16$
C. (3, 4) $2(3) - 4 = 2$
 D. (4, 12)

4

Consider the system $\begin{cases} -2x + y < 3 \\ y + x \geq -5 \end{cases}$.
For $x = 2$, what is the highest integer value of y ?



x Greater than 10 $x > 10$

x Smaller than 10 $x < 10$

K at least 20 $K \geq 20$

K at most 20 $K \leq 20$

M more than 5 $M > 5$

M less than 5 $M < 5$

x no more than 10 $x \leq 10$

x no less than 10 $x \geq 10$



1

If the sum of half a number and 3 is smaller than twice the same number added to 3, which of the following could be the number?

- A. 1
B. 0
C. -0.5
D. -2

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

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

$$0 < 1.5x$$

$$0 < x$$

2

The rental-company manager is supplying chairs and umbrellas for a pool party that 90 guests will attend. The manager will provide enough chairs for at least $\frac{2}{3}$ of the guests and umbrellas for at

most $\frac{2}{3}$ of the guests, where each umbrella shades 3 guests. Which of the following systems represents the number of chairs, c , and the number of umbrellas, u , that the manager will provide for the party?

- A) $c \leq 60$
 $u \geq 20$
B) $c \geq 60$
 $u \geq 20$
C) $c \leq 60$
 $u \leq 20$
D) $c \geq 60$
 $u \leq 20$

3

Jackie has two summer jobs. She works as a tutor, which pays \$12 per hour, and she works as a lifeguard, which pays \$9.50 per hour. She can work no more than 20 hours per week, but she wants to earn at least \$220 per week. Which of the following systems of inequalities represents this situation in terms of x and y , where x is the number of hours she tutors and y is the number of hours she works as a lifeguard?

- A) $12x + 9.5y \leq 220$
 $x + y \geq 20$
B) $12x + 9.5y \leq 220$
 $x + y \leq 20$
C) $12x + 9.5y \geq 220$
 $x + y \leq 20$
D) $12x + 9.5y \geq 220$
 $x + y \geq 20$

4

Claire, a metalsmith, has 500 grams (g) of sterling silver. She wants to use the sterling silver to create at least 20 rings and at least 10 bracelets. She uses 3 g of sterling silver to create each ring and 40 g of sterling silver to create each bracelet. Which of the following systems of inequalities represents this situation, where r is the number of rings and b is the number of bracelets Claire can create with the sterling silver?

- A) $3r + 40b \leq 500$
 $r \geq 3$
 $b \geq 40$
B) $3r + 40b \leq 500$
 $r \geq 20$
 $b \geq 10$
C) $20r + 10b \leq 500$
 $r \geq 3$
 $b \geq 40$
D) $20r + 10b \leq 500$
 $r \geq 20$
 $b \geq 10$



1

A craftsman is looking for two kinds of paint from a wholesaler. The first kind **a** is packaged in 10 kg jars, the second **b** in 25 kg jars. The 10 kg jar costs \$45 and the 25 kg one costs 120\$. The load must **not exceed 250** kg and the total sum must be **at least 900\$** in order to get a discount. Which system of inequalities verifies the given information?

- A. $\begin{cases} 10a + 25b \geq 250 \\ 45a + 120b \leq 900 \end{cases}$ ≤ 250
- B. $\begin{cases} 10a + 25b \leq 250 \\ 45a + 120b \leq 900 \end{cases}$ ≥ 900
- C. $\begin{cases} 10a + 25b \geq 250 \\ 45a + 120b \geq 900 \end{cases}$
- D. $\begin{cases} 10a + 25b \leq 250 \\ 45a + 120b \geq 900 \end{cases}$

2

In a certain board game, a player can make only horizontal and vertical moves with his or her piece on condition that the total number of moves does **not exceed 40** moves out of which **at least 10** are horizontal. **Every horizontal move costs 5** points and every vertical move costs 3 points, and a player Sarah has only 800 points left. If h is the number of horizontal moves that Sarah can make, and v is the number of vertical moves Sarah can make, which of the following systems of inequalities best represents the situation?

- A. $\begin{cases} h + v \geq 40 \\ h \leq 10 \\ 5h + 3v \leq 800 \end{cases}$ ≤ 40
- B. $\begin{cases} h + v \leq 40 \\ h \geq 10 \\ \frac{h}{5} + \frac{v}{3} \leq 800 \end{cases}$
- C. $\begin{cases} h + v \leq 40 \\ h \geq 10 \\ 5h + 3v \leq 800 \end{cases}$
- D. $\begin{cases} h + v \geq 40 \\ h \geq 10 \\ \frac{h}{5} + \frac{v}{3} \geq 800 \end{cases}$

3

Fred wants to save enough money to pay for a car that costs \$7,500 and 12 months of insurance that costs \$110 per month. Fred has already saved \$6,000 and plans to save an additional \$350 per month. Which inequality can be used to determine the number of months, x , Fred could save in order to have enough money to buy the car and pay for 12 months of insurance?

- A) $7,500 - 110x \leq 6,000 - 250(12)$
- B) $7,500 + 110x \leq 6,000 + 250(12)$
- C) $7,500 - 110(12) \leq 6,000 - 350x$
- D) $7,500 + 110(12) \leq 6,000 + 350x$

4

Ryan has 1,500 yards of yarn. He wants to knit at least 2 scarves and at least 3 hats. Each scarf requires 300 yards of yarn, and each hat requires 120 yards of yarn. If s represents the number of scarves and h represents the number of hats, which of the following systems of inequalities represents this situation?

- A) $\begin{cases} s + h \leq 1,500 \\ s \geq 2 \\ h \geq 3 \end{cases}$
- B) $\begin{cases} 2s + 3h \leq 1,500 \\ s \geq 2 \\ h \geq 3 \end{cases}$
- C) $\begin{cases} 2s + 3h \leq 1,500 \\ s \geq 300 \\ h \geq 120 \end{cases}$
- D) $\begin{cases} 300s + 120h \leq 1,500 \\ s \geq 2 \\ h \geq 3 \end{cases}$

