CHAPTER 10.1

Systems of Linear Equations in Two Variables

Multiple-Choice Old Exam Questions

17 questions • 3 topics • options A–E • two questions per page

Topic 1 | Solving a System of Two Linear Equations

Finding the solution of a system, including systems with fractions and radicals, and then a combination of its coordinates • Questions 1–6

Q **1**

If (a, b) is the solution of the system of equations $\begin{cases} 2\sqrt{2}x + 3\sqrt{5}y = 7 \\ 3\sqrt{2}x - \sqrt{5}y = -17 \end{cases}$, then $ab =$

A) $-4\sqrt{5}$

B) $4\sqrt{10}$

C) $-2\sqrt{10}$

D) $2\sqrt{10}$

E) -20

Q **2**

If (m, n) is the solution of the system $\begin{cases} 3x - y = 0 \\ 5x + 2y = 22 \end{cases}$, then $m + n =$

A) 8

B) 4

C) -4

D) 6

E) -2

Q
3

If $(a,\ b)$ is the solution of the system of equations $\begin{cases} \frac{2x-1}{3}+\frac{y+2}{4}=4 \quad (1) \\ \frac{x+3}{2}-\frac{x-y}{3}=3 \quad (2) \end{cases}$, then $a-b=$

A) 1

B) 7

C) 5

D) 3

E) 2

Q
4

If $(p,\ q)$ is the solution of the system $\begin{cases} \frac{3}{4}x+\frac{1}{2}y=5 \\ \frac{1}{4}x-\frac{3}{2}y=1 \end{cases}$, then $p-q=$

A) 6

B) $\frac{34}{5}$

C) $-\frac{32}{5}$

D) 8

E) -8

Q
5

If the ordered pair $(a,\ b)$ is the solution of the system $\begin{cases} \frac{x+6}{5}+\frac{2y-x}{10}=1 \\ \frac{x+2}{4}+\frac{3y+2}{5}=-3 \end{cases}$, then $a+b=$

A) -32

B) 32

C) -100

D) -104

E) 100

Q
6

If $(a,\ b)$ is the solution of the system $\begin{cases} \frac{x-y}{2}-\frac{x+y}{4}=1 \\ 2x-3y=5 \end{cases}$, then $a+b=$

A) 0

B) 1

C) 2

D) 3

E) 4

Topic 2 | Dependent, Inconsistent and Unique Systems

Finding the values of a constant that make a system dependent, inconsistent or uniquely solvable, and describing the solution set • Questions 7–14

Q **7**

If the system $\begin{cases} x - 3y = 1 \\ 2x + my = m + 8 \end{cases}$ is dependent, then the solution set is given by

A) $\{(3t + 1,\ t),\ t \text{ is any real number}\}$

B) $\{(t,\ 3t + 1),\ t \text{ is any real number}\}$

C) $(-\infty, \infty)$

D) $\emptyset$

E) $\{(t,\ t + 8),\ t \text{ is any real number}\}$

Q **8**

If the system of equations $\begin{cases} \frac{x}{3} - \frac{y}{2} = \frac{3}{2} \\ \frac{2x}{3} + ky = \frac{3}{2} \end{cases}$ is inconsistent, then $k =$

A) -1

B) -2

C) 1

D) 2

E) $\frac{1}{2}$

Q
9

The sum of all the possible values of k for which the system $\begin{cases} k^2x + 2x - 6y = 2 \\ kx + 2y = 12 \end{cases}$ is inconsistent is equal to

A) -3

B) 1

C) -1

D) 3

E) -2

Q
10

If the system of linear equations $\begin{cases} x - 6y = 2 \\ kx + 3y = 4 \end{cases}$ is inconsistent, then

A) $k = -\frac{1}{2}$

B) $k = -2$

C) $k < -2$

D) $k = 2$

E) $k > \frac{1}{2}$

Q
11

The set of all values of k for which the system $\begin{cases} 3x + ky = 11 \\ 2x + 4y = 9 \end{cases}$ has a unique solution is

A) $\{k \mid k \leq 6\}$

B) $\{6\}$

C) $\{k \mid k \geq 6\}$

D) $\left\{k \mid k \neq \frac{3}{2}\right\}$

E) $\{k \mid k \neq 6\}$

Q
12

Which one of the following ordered pairs is a possible solution of the system of linear equations $\begin{cases} 2x - \frac{1}{2}y = -1 \\ -8x + 2y = 4 \end{cases}$

A) $\left(\frac{y+2}{2},\ y\right)$

B) $\left(\frac{y-2}{4},\ y\right)$

C) $(x,\ 2x - 5)$

D) $(x,\ 3x + 8)$

E) $(x,\ 2x + 5)$

Q
13

If the linear system $\begin{cases} -2x + 2y = -1 \\ 3x - ky = 2 - k \end{cases}$ is inconsistent, then $k =$

A) 3

B) -3

C) 6

D) -6

E) 4

Q
14

If the system $\begin{cases} 4x + 6y = k \\ 6x + 9y = 6 \end{cases}$ is dependent, then $2k + 1 =$

A) 9

B) 3

C) 5

D) 16

E) 0

Topic 3 | Applications and Unknown Constants

A word problem, lines meeting at one point, and finding unknown coefficients from a known solution • Questions 15–17

Q **15**

A class of 195 students went on a field trip. They took 7 vehicles, some cars and some buses. If each car holds 5 students and each bus holds 45 students, then the number of cars they took is

A) 3

B) 4

C) 5

D) 2

E) 9

Q **16**

If the lines whose equations are $2x + 3y = 1$, $x = 3y + 5$ and $kx + 3y = 3$ all intersect at the same point, then the value of k is:

A) 3

B) 4

C) 0

D) -2

E) -1

Q
17

If $(2, -1)$ is a solution of the linear system $\begin{cases} ax - by = 12 \\ bx + ay = -1 \end{cases}$, then $a + b =$

A) 7

B) 8

C) 4

D) 6

E) 9

Answer Key

"Original" shows the question number in the source worksheet.

Q	Original	Ans.	Value
1	1	**C**	$-2\sqrt{10}$
2	6	**A**	8
3	9	**D**	3
4	10	**A**	6
5	12	**B**	32
6	16	**A**	0
7	3	**A**	$\{(3t+1,\ t),\ \ t \text{ is any real number}\}$
8	4	**A**	-1
9	5	**A**	-3
10	7	**A**	$k=-\frac{1}{2}$
11	8	**E**	$\{k \mid\ k \neq 6\}$
12	11	**B**	$\left(\frac{y-2}{4},\ y\right)$
13	15	**A**	3
14	17	**A**	9
15	2	**A**	3
16	13	**A**	3
17	14	**A**	7