

# M210 SYSTEMS

1

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$$2x + 4y = 12$$

$$3x + 6y = b$$

In the given system of equations,  $b$  is a constant. If the system has infinitely many solutions, what is the value of  $b$ ?

A) 3  
B) 6  
C) 12  
D) 18

2

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$$5x - y = 9$$

$$-60x + 12y = -108$$

How many solutions does the given system of equations have?

A) Zero  
B) Exactly one  
C) Exactly two  
D) Infinitely many

3

9

$$kx - 3y = 4$$

$$4x - 5y = 7$$

In the system of equations above,  $k$  is a constant and  $x$  and  $y$  are variables. For what value of  $k$  will the system of equations have no solution?

A)  $\frac{12}{5}$   
B)  $\frac{16}{7}$   
C)  $-\frac{16}{7}$   
D)  $-\frac{12}{5}$

4

9

$$2x + 6y = 2$$

$$2(2x + y) = 20$$

How many solutions does the given system of equations have?

A) Zero  
B) Exactly one  
C) Exactly two  
D) Infinitely many

5

14

$$y = x^2 - 1$$

$$4 = x + y$$

The graphs in the  $xy$ -plane of the two equations above have how many points of intersection?

A) None  
B) One  
C) Two  
D) Three

6

14

$$y = 2x + 5$$

$$y = kx + 3$$

In the given system of equations,  $k$  is a constant. The system has exactly one solution. Which of the following could be the value of  $k$ ?

I. 2  
II. 5

A) I only  
B) II only  
C) I and II  
D) Neither I nor II

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15

$$2x - 3y = 5$$

One of the two equations in a system is given. The system has an infinite number of solutions. Which equation could be the other equation in the system?

A)  $4x - 6y = 10$   
 B)  $4x + 6y = 10$   
 C)  $2x - 3y = 10$   
 D)  $2x + 3y = 10$

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One of the two equations in a linear system is  $2x + 2y = 2$ . The system has no solution. Which equation could be the other equation in the system?

A)  $3x - 3y = 3$   
 B)  $3x + 3y = 3$   
 C)  $2x - 2y = 2$   
 D)  $2x + 2y = 3$

9

15

$$\begin{aligned} -3x + y &= 6 \\ ax + 2y &= 4 \end{aligned}$$

In the system of equations above,  $a$  is a constant. For which of the following values of  $a$  does the system have no solution?

A)  $-6$   
 B)  $-3$   
 C)  $3$   
 D)  $6$

10

20

$$\begin{aligned} ax + by &= 12 \\ 2x + 8y &= 60 \end{aligned}$$

In the system of equations above,  $a$  and  $b$  are constants. If the system has infinitely many solutions, what is the value of  $\frac{a}{b}$ ?

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$$\begin{aligned} 2x - y &= 3 \\ 4x - y &= 3 \end{aligned}$$

How many solutions does the system of equations have?

A) Zero  
 B) Exactly one  
 C) Exactly two  
 D) Infinitely many

12

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One of the two equations in a linear system is  $2x + 6y = 10$ . The system has no solution. Which of the following could be the other equation in the system?

A.  $x + 3y = 5$   
 B.  $x + 3y = -20$   
 C.  $6x - 2y = 0$   
 D.  $6x + 2y = 10$

13

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$$2x + 3y = 5$$

$$4x + cy = 8$$

In the system of equations above,  $c$  is a constant. For what value of  $c$  will there be no solution  $(x, y)$  to the system of equations?

A) 3  
B) 4  
C) 5  
D) 6

14

36

$$\frac{3}{4}x - \frac{1}{2}y = 12$$

$$ax - by = 9$$

The system of equations above has no solutions. If  $a$  and  $b$  are constants, what is the value of  $\frac{a}{b}$ ?

15

26

$$4x - y = 3$$

One of the two equations in a linear system is given. The system has exactly one solution. Which equation could be the other equation in the system?

A)  $-4x + y = 6$   
B)  $4x - y = 3$   
C)  $4x + y = 5$   
D)  $4x - y = 5$

16

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In the  $xy$ -plane, the equations  $x + 2y = 10$  and  $3x + 6y = c$  represent the same line for some constant  $c$ . What is the value of  $c$ ?

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$$y = \frac{3}{2}x - \frac{1}{2}$$

$$y = \frac{k}{3}x + \frac{1}{3}$$

In the system of equations above,  $k$  is a constant. If the system has no solutions, what is the value of  $k$ ?

18

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A system of two linear equations has no solutions. The graph of one of the equations in the system is shown in the  $xy$ -plane.

The second equation in the system is  $ax - y = 1$ , where  $a$  is a constant. What is the value of  $a$ ?

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4. A system of three equations and their graphs in the  $xy$ -plane are shown above. How many solutions does the system have?

$x^2 + y^2 = 5$   
 $y = x^2 - 3$   
 $x - y = 1$

A) One  
 B) Two  
 C) Three  
 D) Four

20

9. A system of three equations is graphed in the  $xy$ -plane above. How many solutions does the system have?

A) None  
 B) One  
 C) Two  
 D) Three

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15. Which of the following is a graph of a system of equations with no solution?

A)

B)

C)

D)

- 1 D
- 2 D
- 3 A
- 4 B
- 5 C
- 6 B
- 7 A
- 8 D
- 9 A
- 10 1/4 = .25
- 11 B
- 12 B
- 13 D
- 14 3/2 or 1.5
- 15 C
- 16 30
- 17 4.5 or 9/2
- 18 5/4 or 1.25
- 19 B
- 20 B
- 21 A