

## Exercise Set 5 (No Calculator)

1

If  $3x + 2y = 72$ , and  $y = 3x$ , what is the value of  $x$ ?

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2

If  $2a - 7b = 10$  and  $2a + 7b = 2$ , what is the value of  $4a^2 - 49b^2$ ?

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3

If the lines  $y = -4x - 3$  and  $y = -3x - b$  intersect at the point  $(-1, c)$ , what is the value of  $b$ ?

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4

If the lines  $4x + 5y = 13$  and  $4y + kx = 2$  are parallel, what is the value of  $k$ ?

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5

If the lines  $4x + 5y = 13$  and  $6y - kx = 6$  are perpendicular, what is the value of  $k$ ?

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6

$$\frac{2a}{b} = \frac{1}{3}$$

$$\frac{c}{b} + 1 = \frac{5}{3}$$

Based on the system of equations above, what is the value of  $\frac{a}{c}$ ?

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7

If  $ab = -4$  and  $abc = 12$ , what is the value of  $\frac{c}{ab}$ ?

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8

If  $a$  and  $b$  are constants and the graphs of the lines  $2x - 3y = 8$  and  $ax + by = 2$  are perpendicular, then what is the value of  $\frac{3a}{b}$ ?

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9

$$5x - y = 11$$

$$2x - 2y = 9$$

Based on the system of equations above, what is the value of  $3x + y$ ?

- A)  $-2$
- B)  $0$
- C)  $2$
- D)  $4$

10

Two numbers have a difference of 4 and a sum of  $-7$ . What is their product?

- A)  $-33$
- B)  $-10.25$
- C)  $8.25$
- D)  $10.25$

11

It costs Emma  $p$  dollars to make each of her custom bracelets, which she sells for  $m$  dollars apiece. She makes a profit of \$60 if she makes and sells 5 of these bracelets, but she only makes a profit of \$10 if she makes 5 bracelets but only sells 4 of them. How much does it cost Emma to make each bracelet?

- A) \$36
- B) \$38
- C) \$48
- D) \$50

## Exercise Set 5 (Calculator)

12

If  $2y = x + 1$  and  $4x + 6y = 0$ , then  $y =$

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13

If  $6x + 7y = \frac{4}{5}$  and  $6x - 7y = \frac{6}{5}$ , then  $y =$

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$$2x - 5y = 20$$

$$10x - 25y = 4k$$

14

For what value of  $k$  does the system of equations above have at least one solution?

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15

At the beginning of the week, the ratio of cats to dogs at Glenna's Pet Store was 4 to 5. By the end of the week, the number of cats had doubled, while the number of dogs had increased by 12. If the ratio of cats to dogs at the end of the week was 1 to 1, how many cats did the store have at the beginning of the week?

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16

Jenny originally had twice as many friendship bracelets as Emilie. After Jenny gave Emilie 5 of her friendship bracelets, Jenny still had 10 more than Emilie. How many friendship bracelets did Jenny have originally?

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17

The average (arithmetic mean) of  $x$  and  $y$  is 14. If the value of  $x$  is doubled and the value of  $y$  is tripled, the average (arithmetic mean) of the two numbers remains the same. What is the value of  $x$ ?

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18

$$7m + 10n = 7$$

$$6m + 9n = 1$$

Based on the system of equations above, what is the value of  $4m + 4n$ ?

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19

In the  $xy$ -plane, perpendicular lines  $a$  and  $b$  intersect at the point  $(2, 2)$ . If line  $a$  contains the point  $(7, 1)$ , which of the following points is on line  $b$ ?

- A)  $(0, 1)$
- B)  $(4, 5)$
- C)  $(7, 3)$
- D)  $(3, 7)$

20

Which of the following pairs of equations has no solution in common?

- A)  $2x - 3y = 1$  and  $6x - 9y = 3$
- B)  $y = 4x$  and  $y = -4x$
- C)  $2x - 3y = 1$  and  $6x - 9y = 2$
- D)  $y = 4x$  and  $2y - 8x = 0$

21

In the  $xy$ -plane, the line  $l$  is perpendicular to the line described by the equation  $\frac{1}{x} + \frac{1}{2y} = \frac{1}{y}$ . What is the slope of line  $l$ ?

- A)  $-2$
- B)  $-\frac{1}{2}$
- C)  $\frac{1}{2}$
- D)  $2$