

Chapter 5 Quiz 2 Review

Solve the system of equations using any method.

1.
$$\begin{cases} 7x + 4y = 90 \\ 8x + 3y = 84 \end{cases}$$

2.
$$\begin{cases} 12x + y = 210 \\ 9x + \frac{2}{3}y = 155 \end{cases}$$

3.
$$\begin{cases} y = -x + 3 \\ y = x - 1 \end{cases}$$

4.
$$\begin{cases} y - 3x + 9 = 0 \\ 2x + 5y + 11 = 0 \end{cases}$$

5. Using the system of equations below, find the value of d that would result in each situation.

$$\begin{cases} dy = x + 10 \\ 3y = 3x + 30 \end{cases}$$

- One solution
- No solutions
- Infinitely many solutions

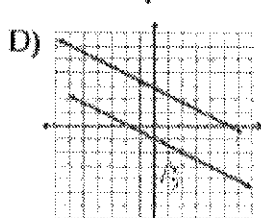
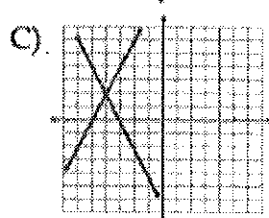
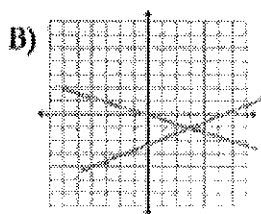
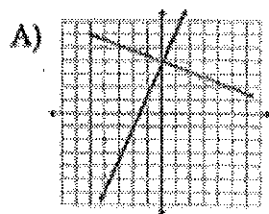
Solve each system of equations. Then, classify the system.

6.
$$\begin{cases} 2y + 4 = 2 + 3x \\ y = \frac{3}{2}x - 4 \end{cases}$$

7.
$$\begin{cases} y = -2x + 2 \\ -\frac{1}{3}x + y = -5 \end{cases}$$

8.
$$\begin{cases} 2y = x + 2 \\ -2y = -x - 2 \end{cases}$$

9. Write a system of equations for each of the graphs below.



10. Classify each of the systems above.

11. A chemist needs to mix 450 ml of a 40% saline solution with a 60% saline solution to make a 45% saline solution. How many ml of the 45% saline solution will he end up making?

12. A kayaker can paddle upstream 24 miles in 3 hours. He can travel downstream 21 miles in 1.75 hours. How fast can he paddle without a current? What is the speed of the current?

13. According to government standards, a 100-gram piece of "extra lean" meat must contain 425 or fewer calories. A piece of extra lean meat contains 190 grams of protein and 10 grams of fat, for a total of 850 calories. A second piece of meat is the same weight, but it is not extra lean.

This piece of meat contains 180 grams of protein and 20 grams of fat, but it has a total of 900 calories. In the equations below, f represents the number of calories in a gram of fat, and p represents the number of calories in a gram of protein.

$$190p + 10f = 850$$

$$180p + 20f = 900$$

How many calories are in a gram of protein?

14. A chemist prepares a solution by mixing 30 mL of liquid c with 50 mL of liquid d , and the resulting solution has a mass of 290 grams. She then combined 50 mL of liquid c with 40 mL of liquid d , and gets a solution that has a mass of 310 grams. In the equations below, c represents the concentration of liquid c , and d represents the concentration of liquid d .

$$30c + 50d = 290$$

$$50c + 40d = 310$$

What is the concentration of liquid c , in **grams/mL**?

15. At the art store, Marie bought five tubes of oil paint and three brushes for \$34.75. Marcel bought three tubes of paint and one brush for \$17.25. In the equations below, t represents the cost of one tube of oil paint and b represents the cost of one brush.

$$5t + 3b = \$34.75$$

$$3t + b = \$17.25$$

What is the cost, in **dollars**, of one brush?

Chapter 5 Quiz 2 Review

1. $7x + 4y = 90$
 $8x + 3y = 84$

$21x + 12y = 270$
 $-(32x + 12y = 336)$

$-11x = -66$
 $x = 6$

$(6, 12)$

$8x + 3y = 84$

$8(6) + 3y = 84$

$48 + 3y = 84$

$3y = 36$

$y = 12$

2. $12x + y = 210$
 $9x + \frac{2}{3}y = 155$

$y = -12x + 210$

$9x + \frac{2}{3}(-12x + 210) = 155$

$9x - 8x + 140 = 155$
 $x = 15$

$(15, 30)$

$12x + y = 210$

$12(15) + y = 210$

$180 + y = 210$

$y = 30$

3. $y = -x + 3$
 $y = x - 1$

$x - 1 = -x + 3$

$2x = 4$

$x = 2$

$(2, 1)$

$y = x - 1$
 $y = 2 - 1$
 $y = 1$

$$4. \begin{cases} y - 3x + 9 = 0 \\ 2x + 5y + 11 = 0 \end{cases}$$

$$\Rightarrow y = 3x - 9$$

$$2x + 5(3x - 9) + 11 = 0$$

$$2x + 15x - 45 + 11 = 0$$

$$17x - 34 = 0$$

$$17x = 34$$

$$x = 2$$

$$(2, -3)$$

$$\begin{array}{r} 25 \\ 100 \overline{) 1.75} \\ 7 \overline{) 2500} \\ 175 \end{array}$$

$$\begin{aligned} y &= 3x - 9 \\ y &= 3(2) - 9 \\ &6 - 9 \\ y &= -3 \end{aligned}$$

$$5. \begin{cases} dy = x + 10 & \rightarrow m = \frac{1}{d} \quad b = \frac{10}{d} \\ 3y = 3x + 30 & \rightarrow m = 1 \quad b = 10 \end{cases}$$

a. One solution - $d \neq 1$

b. zero solutions - not possible

c. infinitely many - $d = \{1\}$

$$6. \begin{cases} 2y + 4 = 2 + 3x \\ y = \frac{3}{2}x - 4 \end{cases}$$

$$2y = 3x - 2$$

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

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

$$-4 \neq -1$$

no solution
inconsistent system

$$7 \quad \begin{aligned} y &= -2x + 2 \\ -\frac{1}{3}x + y &= -5 \end{aligned}$$

$$-x + 3y = -15$$

$$-x + 3(-2x + 2) = -15$$

$$-x - 6x + 6 = -15$$

$$-7x = -21$$

$$x = 3$$

$$(3, 4)$$

consistent
independent

$$-\frac{1}{3}x + y = -5$$

$$-\frac{1}{3}(3) + y = -5$$

$$-1 + y = -5$$

$$y = -4$$

$$8. \quad 2y = x + 2$$

$$-2y = -x - 2$$

$0 = 0$ ✓ true statement

infinitely many solutions
consistent dependent system

$$9. \quad \begin{aligned} a. \quad y &= 3x + 4 \\ y &= -\frac{1}{2}x + 4 \end{aligned}$$

$$b. \quad \begin{aligned} y &= -\frac{1}{3}x \\ y &= \frac{3}{7}x - \frac{10}{7} \end{aligned}$$

$$c. \quad \begin{aligned} y &= 2x + 0 \\ y &= -2x - 6 \end{aligned}$$

$$d. \quad \begin{aligned} y &= -\frac{1}{2}x + 3 \\ y &= -\frac{1}{2}x - 1 \end{aligned}$$

$$y = mx + b$$

$$-1 = \frac{3}{3}(3) + b$$

$$-\frac{7}{7}x = \frac{9}{7} + b$$

$$-\frac{9}{7} - \frac{10}{7} = b$$

$$y = mx + b$$

$$2 = 2(-4) + b$$

$$-8 + b$$

$$12 = b$$

$$y = -2(x) + b$$

$$2 = -2(-1) + b$$

$$8$$

$$-6 = b$$

10. a, b and c - consistent independent
d is inconsistent

11. 40% 60% 45%

equation 1: $450 + x = y$

$$450(.4) + .6x = .45y$$

equation 2: $180 + .6x = .45y$

$$x = y - 450$$

$$180 + .6x = .45y$$

$$180 + .6(y - 450) = .45y$$

$$180 + .6y - 270 = .45y$$

$$-90 = -.15y$$

$$600 = y$$

600 mL of
45% solution

12. upstream $k - c = \frac{24}{3}$

downstream $k + c = \frac{24}{1.5}$

$$k - c = 8$$

$$+ \quad k + c = 12$$

$$2k = 20$$

$$k = 10$$

kayaker - 10 mph
current 2 mph

$$\begin{aligned} 13. \quad 190p + 10f &= 850 \\ 180p + 20f &= 900 \end{aligned}$$

$$\begin{aligned} &\rightarrow 19p + f = 85 \\ &- (9p + f = 45) \end{aligned}$$

$$\begin{aligned} 10p &= 40 \\ p &= 4 \end{aligned}$$

4 calories

$$\begin{aligned} 14. \quad 30c + 50d &= 290 \\ 50c + 40d &= 310 \end{aligned}$$

$$\begin{aligned} &\rightarrow 5(3c + 5d = 29) \\ &\quad 3(5c + 4d = 31) \end{aligned}$$

$$\begin{aligned} 15c + 25d &= 145 \\ (15c + 12d &= 93) \\ 13d &= 52 \\ d &= 4 \end{aligned}$$

$$\begin{aligned} 3c + 5d &= 29 \\ 3c + 5(4) &= 29 \\ 3c + 20 &= 29 \\ 3c &= 9 \\ c &= 3 \end{aligned}$$

3 grams
per mL

$$\begin{aligned} 15. \quad 5t + 3b &= 34.75 \\ 3(3t + b &= 17.25) \end{aligned}$$

$$\begin{aligned} 9t + 3b &= 51.75 \\ (5t + 3b &= 34.75) \end{aligned}$$

$$4t = 17$$

$$t = \frac{17}{4} \quad \$4.25 = \text{tubes}$$

$$\begin{aligned} 3(4.25) + b &= 17.25 \\ 12.75 + b &= 17.25 \\ b &= 4.50 \end{aligned}$$

brushes 10¢
\$4.50