

Complete problems 1 and 2 using Desmos:

1. Solve the following systems of equations:

a) $-2x = -16 - 2y$

$3x - 6y = 30$

$(6, -2)$

b) $15x - 5y = 20$

$6x - 2y = -8$

No solution.

2. What is the sum of the x & y values in the solution to the system:

$3x - 2y = -5$

$4x + 5y = 47$

$(3, 7)$
10

3. Solve the following systems of equations using substitution:

a) $-5x + 3y = 51$

$y = 10x - 8$

$5x + 3(10x - 8) = 51$

$-5x + 30x - 24 = 51$

$25x - 24 = 51$

$+24 \quad 24$

$25x = 75$

$x = 3$

$y = 10(3) - 8$
 $30 - 8$

$(3, 22)$

b) $4.5x + 1.5y = 24$

$x - y = 4$

$+y \quad +y$

$x = 4 + y$

$4.5(4 + y) + 1.5y = 24$

$18 + 4.5y + 1.5y = 24$

$18 + 6y = 24$

$-18 \quad -18$

$6y = 6$

$y = 1$

$(5, 1)$

c) $x - 2y = 7$

$-x + 2y = 7$

$-(7 + 2y) + 2y = 7$

$-7 - 2y + 2y = 7$

$-7 = 7$

No solution

4. Solve the following systems of equations using elimination:

a) $2x = 32 + y$

$y - 5x = 13$

$2(-15) = 32 + y$

$-30 = 32 + y$

$-32 \quad -32$

$y = -62$

$2x - y = 32$

$-5x + y = 13$

$-3x = 45$

$-3 \quad -3$

$x = -15$

$(-15, -62)$

b) $7x + 2y = 8$

$(2)4x + 3y = -1$

$7(2) + 2y = 8$

$-14 + 2y = 8$

$-14 \quad -14$

$-21x - 6y = -24$

$8x + 6y = -2$

$-13x = -26$

$-13 \quad -13$

$x = 2$

$(2, -3)$

5. For what value of k will the given system have infinitely many solutions?

$$\begin{cases} 6x + 9y = -12 \\ 2x + ky = -4 \end{cases} \quad 3$$

$$\frac{k \cdot 3}{3} = \frac{9}{3}$$

$$\boxed{k = 3}$$

equations
must be same
or multiples
of each other.

6. A website allows users to download individual songs or an entire album. All songs cost the same and all albums cost the same. Anthony pays \$14.94 for 5 songs and 1 album. Taylor pays \$22.95 for 3 songs and 2 albums.

a) Write a system of equations to describe this situation.

$$\begin{aligned} (1) \quad 5s + 1a &= 14.94 \\ (2) \quad 3s + 2a &= 22.95 \end{aligned}$$

$$\begin{aligned} 5(.99) + a &= 14.94 \\ 4.95 + a &= 14.94 \\ -4.95 & \quad -4.95 \\ \hline a &= 9.99 \end{aligned}$$

b) How much does it cost for each song and each album?

$$\begin{aligned} -10s - 2a &= -29.88 \\ 3s + 2a &= 22.95 \\ \hline -7s &= -6.93 \\ \hline s &= .99 \end{aligned}$$

Song = .99
album = 9.99

c) How much would 19 songs and 3 albums cost to download?

$$19(.99) + 3(9.99) = 18.81 + 29.97 = 48.78$$

7. Nick has 82 coins in his piggy bank. All are quarters and dimes. Their total value is \$11.65

a) Write a system of equations to describe this situation.

$$\begin{aligned} Q + d &= 82 \\ .25Q + .10d &= 11.65 \end{aligned}$$

$$Q = 82 - d \quad \checkmark$$

b) How many of each type of coin does he have?

$$.25(82 - d) + .10d = 11.65$$

$$20.5 - .25d + .10d = 11.65$$

$$\begin{aligned} 20.5 - .15d &= 11.65 \\ -20.5 & \quad -20.5 \\ \hline \end{aligned}$$

$$-.15d = -8.85$$

$$d = 59 \text{ dimes}$$

$$Q = 82 - d = 82 - 59 = 23 \text{ quarters}$$