

SYSTEMS OF LINEAR EQUATIONS WORD PROBLEMS: SUBSTITUTION

For each problem below, write a system of equations, solve using substitution, and write your final answer as a complete sentence. **Equations may vary.**

- 1 Sanjay and Luca are swimming laps at the pool. Sanjay has already completed 5 laps and swims 3 more laps each minute. Luca has already completed 9 laps and swims 2 more laps each minute. At these rates, how many minutes will it take Sanjay and Luca to swim the same number of laps?

$$\ell = 3m + 5$$

$$\ell = 2m + 9$$

It will take Sanjay and Luca 4 minutes to swim the same number of laps.

- 2 Nori and Mason are participating in a recycling challenge. Nori has 14 pounds of aluminum cans and set a goal to collect 3 more pounds each week. Mason has 6 pounds of aluminum cans and set a goal to collect 4 more pounds each week. If they meet their goals, in how many weeks will Nori and Mason have collected the same amount of aluminum cans?

$$p = 3w + 14$$

$$p = 4w + 6$$

Mason and Nori will have collected the same amount of aluminum cans in 8 weeks.

- 3 Andy is a landscaper. Yesterday, he planted a 2-foot-tall elm tree and a 14-foot-tall maple tree. The elm tree is expected to grow 5 feet taller each year. The maple tree is expected to grow 2 feet taller each year. At those rates, in how many years will the trees be the same height?

$$h = 5y + 2$$

$$h = 2y + 14$$

The trees will be the same height in 4 years.

- 4 Abe wants to get a gym membership. He looks at two gyms to compare prices. The first gym charges \$30 to join and \$15 per month. The second gym has no fee to join and charges \$25 per month. After how many months would the two gyms have the same total cost?

$$c = 15m + 30$$

$$c = 25m$$

The two gyms would have the same cost after 3 months.

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For each problem below, write a system of equations, solve using substitution, and write your final answer as a complete sentence. **Equations may vary.**

- 5 Javion and Hugo are reading the same book. Javion has read 60 pages, and Hugo has read 20 pages. Starting now, Javion will read 10 pages each day, and Hugo will read 15 pages each day. They calculate that they will finish reading the book on the same day. In how many days will the boys complete the book? How many pages are in the book?

$$p = 10d + 60$$

$$p = 15d + 20$$

The boys will complete the book in 8 days, and there are 140 pages in the book.

- 6 The art room at the community center has 9 tables that seat 30 people in all. Some of the tables are circular, and some are rectangular. Each circular table seats 3 people, and each rectangular table seats 4 people. How many circular tables are in the art room? How many round tables are in the art room?

$$c + r = 9$$

$$3c + 4r = 30$$

There are 6 circular tables and 3 round tables in the art room.

- 7 Eric and Lucia are playing Universe Navigators, a game where players get a set number of points for traveling to an asteroid and a set number of points for traveling to a planet. Eric travels to 1 asteroid and 8 planets, earning a total of 132 points. Lucia travels to 3 asteroids and 7 planets, earning a total of 141 points. How many points do players earn for traveling to an asteroid? How many points do players earn for traveling to a planet?

$$a + 8p = 132$$

$$3a + 7p = 141$$

Players earn 12 points for traveling to an asteroid and 15 points for traveling to a planet.

- 8 A delivery truck is loaded with 60 crates of tomatoes. The crates with the cherry tomatoes weigh 40 pounds each, and the crates with the Roma tomatoes weigh 65 pounds each. The truck is carrying 3,000 pounds of tomatoes in all. How many crates of cherry tomatoes are on the truck? How many crates of Roma tomatoes are on the truck?

$$c + r = 60$$

$$40c + 65r = 3,000$$

There are 36 crates of cherry tomatoes and 24 crates of Roma tomatoes on the truck.