Get Ready for Grade 9 Modelling With Equations Worked Examples and Practice

Example 1: Julio is twice as old as his cousin Juanita. The sum of their ages is 27. How old are Julio and Juanita?

Solution: Let Juanita's age be represented by x. Julio's age is $2x$.

$$2x + x = 27$$
$$3x = 27$$
$$\frac{3x}{3} = \frac{27}{3}$$
$$x = 9$$

Juanita is 9, and Julio is 18.

Example 2: A truck with a snow plow costs $5000 more than a truck without. Viola bought one of each to use in her trucking business, and paid $125 000 in total. What is the cost of just the truck?

Solution: Let the cost of the truck be c. The cost of the truck with the snow plow is $c + 5000$.

$$c + c + 5000 = 125\ 000$$
$$2c + 5000 = 125\ 000$$
$$2c + 5000 - 5000 = 125\ 000 - 5000$$
$$2c = 120\ 000$$
$$\frac{2c}{2} = \frac{120\ 000}{2}$$
$$c = 60\ 000$$

The cost of the truck is $60 000.

Example 3: Sally and Charlie have college savings accounts. Sally has twice as much money as Charlie, plus another $250. The total of their accounts is $4750. How much money does Charlie have in his account?

Solution: Let the amount of money in Charlie's account be m dollars. The amount in Sally's account is $2m + 250$.

$$m + 2m + 250 = 4750$$
$$3m + 250 - 250 = 4750 - 250$$
$$3m = 4500$$
$$\frac{3m}{3} = \frac{4500}{3}$$
$$m = 1500$$

Charlie has $1500 in his account.

Example 4: An orange costs 25 cents more than an apple. Astrid bought five of each. The total cost was $6.25. How much was an apple?

Solution: Let the cost of an apple be a. The cost of an orange is $a + 25$.

$$5a + 5(a + 25) = 625$$
$$5a + 5a + 125 = 625$$
$$10a + 125 - 125 = 625 - 125$$
$$10a = 500$$
$$\frac{10a}{10} = \frac{500}{10}$$
$$a = 50$$

An apple costs 50 cents.

Practice:

1. A twin-engine Cessna 310 burns three times as much fuel as a single-engine Piper Cherokee. A flying club flew both aircraft to a fly-in air show. On arrival, it took 200 L of fuel to refill the tanks on both aircraft. How much fuel was burned by the Cherokee?

2. It costs $3000 more to pave a driveway with concrete than with asphalt. Laura and Roberto are neighbours with identical driveways. One was paved with concrete, and the other with asphalt. The total bill was $15 000. How much did the asphalt driveway cost?

3. Bela has five more than three times as many sheep on his farm than John. Together, they have 565 sheep. How many sheep does John have?

4. A copy centre charges an extra 5 cents for coloured copies compared to standard copies. Erika needed 100 standard copies and 50 coloured copies. She paid a total of $8.50. How much does a standard copy cost?

Answers: 1. 50 L 2. $6000 3. 140 sheep 4. 4 cents.