

SHARP

Worksheet 9: Algebraic Equations Term 1

Grade 9 Mathematics

1. Read the following sentences, or stories, and create an equation for each one. Then solve for the variable in the equation and find the missing value.
- a) George has a certain number of apples, and Sarah has 4 times as many apples as George. They have a total of 25 apples.
 - b) There are a certain number of cupcakes. If the cupcakes are shared amongst 8 children, they get 3 cupcakes each.
 - c) There are 73 children in a classroom. A certain number are boys and the other 31 are girls.
 - d) There are 5 boxes with a certain number of mugs in each box. In total there are 60 mugs.
 - e) Henry has a certain amount of pocket money. His sister, Lucy, gets $\frac{2}{3}$ of the amount of money that Henry gets. Altogether they get R600 pocket money.
 - f) There are 42 cupcakes. If they are divided amongst a certain number of teachers, each teacher will get 3 cupcakes.
 - g) There are 120 different rascals. There are 36 blue rascals, a certain number of red rascals and $\frac{3}{4}$ of the number of red rascals are green rascals.
 - h) There are 8 containers of sweets with the same number of sweets in each container. The containers are all emptied and the sweets are counted. After you eat 5 sweets, there are 995 sweets.
 - i) A class has 32 boys and girls. There are 3 times as many girls as boys.
 - j) There are a certain number of pens in a box. If each child in a class of 25 children gets 5 pens, how many pens are in the box?

2. Solve the following equations for x :

a) $3x + 7 = 19$

b) $\frac{45}{x} + 2 = 11$

c) $\frac{x}{4} - 5 = 0$

d) $48 - 3x = 84$



- e) $\frac{72}{x} - 12 = 4$ f) $5(x + 3) = 15$
- g) $7x - 10 = 3(2x + 12)$ h) $\frac{2}{3}x - 4 = 2(x - 3)$
- i) $3(2 - x) + 4 = 5(x - 7)$ j) $\frac{x}{-5} + 7 = 1$
- k) $\frac{48}{x} + 10 = 4$ l) $5(x + 2) = 3(7 - 2x)$
- m) $\frac{4x+7}{5} = 2$ n) $\frac{91}{x+1} - 2 = 5$
- o) $7(x - 3) + 4 = 5(3 - x)$ p) $x^3 + 1 = 9$
- q) $5^x - 1 = 124$ r) $\frac{1}{2}x + \frac{2}{3}x = 4$
- s)* $ax + b = c$ t) $120 = 4\pi x^2$

* This question is an introduction into rewriting equations in terms of x .

3. Solve for the missing value in each of these story sums. If necessary, draw a picture to help you.

- a) Thabang and her 3 friends, take their 6 baby sisters to the movies. The movies tickets for children under the age of 12 cost $\frac{1}{2}$ the price of normal movie tickets. Altogether the movie tickets cost R224. How much does one ticket cost?
- b) The area of a square is 36cm^2 . How long is one side of the square? And what is the perimeter of the square?
- c) The volume of a lunch box is 252cm^3 . The length of the lunch box is 7cm, the breadth is 9cm and the height is $x\text{cm}$. What is the height of the lunch box?
- d) Nathi goes to a school that is 15km away from home. In the morning it takes him 45 minutes to get to school, and in the afternoon it takes him only 20 minutes to get home. What was Nathi's average speed?
- e) Find the value of x in the triangle below:

