

ALGEBRAIC EXPRESSIONS & EQUATIONS

An **algebraic expression** is a mathematical phrase that can contain ordinary numbers, variables (like x or y) and operators (like add, subtract, multiply, and divide). Examples: $a + 3$, $4ab - 9$

An **algebraic equation** is the combination of two equivalent expressions that are separated by an equals sign. Examples: $3x + 2 = 14$, $5y + 7 = 4y + 10$

1. A boy has m mangoes. He sells three of them.
 - a. Write an expression to represent how many mangoes he now has.
 - b. If he now has 10 mangos, write an equation to represent the situation.
 - c. Solve the equation from part (b).
2. A boy is 12 years old. How old will he be in y years time?
 - a. Write an expression to represent the boys age in y years time.
 - b. In y years time the boy will be 27. Write an equation to represent the situation.
 - c. Solve the equation from part (b).
3. A man walks h km towards a village which is 5 km away.
 - a. Write an expression to represent how far he is currently from the village.
 - b. If he is currently 2.7km from the village, write an equation to represent the situation.
 - c. Solve the equation from part (b).
4. Ryan has b books. He sells half of his books then buys 13 more.
 - a. Write an expression to represent half of the books.
 - b. Write an expression to represent the situation after buying the extra books.
 - c. If he now has 38 books, write an equation to represent the situation.
 - d. Solve the equation from part (c).
5. 285 students go on a trip. 5 buses are filled and 15 students travel by car.
 - a. If each bus carries p passengers, write an expression for the number of passengers carried by 5 busses.
 - b. Write an expression for the number of passengers carried by the 5 busses and the cars.
 - c. Write an equation to represent the problem.
 - d. Solve the equation from part (c).
6. Alisha has £24 to spend on notebooks. She buys 3 notebooks and has £12 left over.
 - a. If each notebook costs n pounds, write an expression for the cost of three notebooks.
 - b. Write an expression to represent how much money she had after buying the three notebooks.
 - c. Set the expression equal to the amount she has left over to create an equation.
 - d. Solve the equation from part (c).

Section B

For each of the following questions you must

- a) Define your variable.
- b) Write an equation to represent the problem.
- c) Solve the equation, showing all working out.

1. A cycle shop rents bicycles for £18 plus £3 per hour. Jamie paid £39. For how long did he rent the bicycle?
2. Elisha bought a magazine for £2.25 and 5 candy bars. She spent £8.50. How much did each candy bar cost?
3. The sum of three consecutive numbers is 102. What is the smallest number?
4. Benny spent half of his allowance going to the movies. He washed the family car and earned £7. What is his weekly allowance if he ended with £16?
5. The sum of three consecutive even numbers is 150. What is the smallest of the three numbers?
6. The length of a football field is 30 yards more than its width. Express the length of the field in terms of its width w . If the perimeter of the field is 340 yards, find the width of the field.
7. At an event, there were 3 less than 4 times the number of students from John Colet School compared to the number of students from The Grange. Let g be the number of students from The Grange. If there were a total of 37 students from the two schools, find the number of students from each school.
8. You go bowling with 6 friends. It costs £6 per game and £2.50 each for shoe rental. If it costs a total of £41.50 for your day bowling, how many games did you and your friends play?
9. The sum of four consecutive odd numbers is 136. What is the smallest of the four numbers?
10. Half the difference between the fourth multiple of a number and 16 is 6. What is the number?