

## Forming algebraic expressions and equations 1 – www.m4ths.com

$3n$ ,  $p+1$ ,  $2a+3b$  &  $t^2$  are all **expressions** &  $3x-1=7$ ,  $2p+4=3-p$  &  $2(y-2)=3y$  are all **equations**

### Task 1 – Writing expressions

(1) Bob has  $n$  pens. Fred has 3 more pens than Bob and Sue has three times as many pens as Bob.

(a) Write an expression in terms of  $n$  for the number of pens Fred has.

(b) Write an expression in terms of  $n$  for the number of pens Sue has.

(c) Write an expression in terms of  $n$  for the **total** number of pens Bob, Fred and Sue have.

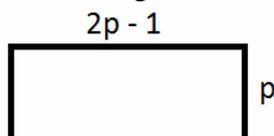
(2) Simon is  $n$  years old. James is 5 years younger than Simon and Kate is double Simon's age.

(a) Write an expression for James' age and Kate's age.

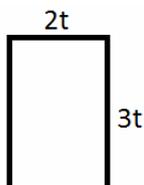
(b) Find the sum of the ages of Simon, James and Kate in terms of  $n$ .

(c) Explain why your answer to part (b) is an expression and not an equation.

(3) Write an expression for the perimeter of the rectangle below:



(4) Write an expression for the area and the perimeter of the rectangle below:



(5) Terry has  $t$  coins. Bob has one coin less than Terry and Jane has one more than double the number Terry has. Write a simplified expression for the total number of coins the 3 people have.

### Task 2 – Setting up equations (Just set them up! You don't have to solve them)

(1) Laura is  $x$  years old. Tom is 3 years older than Laura. Given that their combined age is 25, set up a simplified equation to show this information.

(2) The perimeter of the shape in question (4) in Task 1 is 30cm. Write an equation to model this situation.

(3) Kevin has  $m$  coins. Harriet has four times as many coins and Larry has 1 less coin than Harriet. In total they have 71 coins. Set up an equation in  $m$  to show the information giving your answer in its simplest form.

(4) Jerry, Kerry and Fred all get paid  $\pounds k$  an hour at work. Jerry works 2 hours, Kerry 1 hour and Fred 5 hours. Given that they earn a total of  $\pounds 400$  between them, set up an equation in terms of  $k$  to show this information.

### Task 3 – Solving Equations – You MUST set up and solve an equation to answer each of these!

(1) Nikki is  $y$  years old. Eric is three years younger than Nikki and Jon is 2 years older than Nikki. Given that their combined age is 68: (a) Find the value of  $y$  and (b) Find the age of Nikki, Eric and Jon.

(2) Given that the perimeter of the rectangle in question (3) in Task 1 is 40cm, set up and solve an equation to (a) Find the value of  $p$ , (b) Find the dimensions of the rectangle and (c) Find the area of the rectangle.

(3) Colin has  $2t-1$  badges. Fred has 3 more badges than Colin and Yan has 4 more badges than Colin. Given that they have 40 badges in total, find out how many badges they each have.

(4) Jeff works  $k$  hours. Bill works one hour less than Jeff and Sue works 3 more hours than Bill. Given that they work a total of 94 hours between them, find out how many hours Sue works.

(5) A triangle has side lengths  $n$ ,  $2n-1$  and  $3n+1$ . Given that its perimeter is 120cm find the length of each side.

(6) Given that the shortest side length of the rectangle in question (4) in Task 1 is 17cm, find the perimeter of the rectangle.

### Task 4

(1) Explain the difference between an expression, equation, inequality and identity! (Look it up if you need to)