# Unit 12 · Algebraic Expression

**HARDER PRACTICE QUESTIONS**

Full marks 29

Write your answers on separate paper. Show your working, and check each answer by putting in a number where you can.

## 1 Spot the errors [3]

Ashish wrote three answers. Correct each one, and say what he did wrong.

i. $3x + 2y = 5xy$

ii. $(5a - 2b) - (3a - b) = 2a - 3b$

iii. $2x \times 3x = 6x$

## 2 Round a triangle [3]

The sides of a triangle are $(2x + 3)$ cm, $(3x - 1)$ cm and $(x + 5)$ cm.

i. Find its perimeter.

ii. Find the perimeter when $x = 4$.

iii. Check your answer to ii by finding each side first.

## 3 What must be added? [3]

i. What must be added to $3a + 2b$ to give $7a - b$?

ii. Check your answer by adding.

iii. What must be **taken away** from $7a - b$ to give $3a + 2b$?

## 4 A rectangle of letters [3]

A rectangle is $3x$ cm long and $(2x + 5)$ cm broad.

i. Find its area.

ii. Find its area when $x = 2$.

iii. Find its perimeter.

## 5 The missing side [3]

A rectangle has an area of $(12a^2 + 8a)$ cm$^2$ and a breadth of $4a$ cm.

i. Find its length.

ii. Check your answer by multiplying back.

iii. Find the length when $a = 5$.

## 6 Ages in letters [4]

Lhakpa is $x$ years old. His sister is 3 years older than him, and his father is 4 times as old as Lhakpa.

i. Write the sister's and the father's ages, and the sum of all three ages.

ii. Write the sum of their ages in 5 years' time.

iii. Find both sums when $x = 7$.

iv. Will the father still be 4 times as old as Lhakpa in 5 years? Use $x = 7$ to check.

## 7 Values with a trap [3]

Find the value of $2a^2 - 3ab + b^2$ when

i. $a = 3$ and $b = 2$;

ii. $a = 2$ and $b = 5$.

iii. Pratik says $2a^2 = 36$ when $a = 3$. What did he do wrong?

## 8 Make your own [3]

Write two binomials, one of them with a minus sign, whose sum is $5x + 2y$. Then show that they add up to it.

## 9 Think: the number trick [4]

Isha says: "Think of a number. Multiply it by 3. Add 6. Divide by 3. Take away the number you first thought of. Your answer is 2!"

i. Try the trick with two different numbers.
ii. Call the first number $n$, and write what you have after each step.
iii. Explain why the answer is always 2.
iv. Change one step so that the answer is always 5.