Unit 15 · Algebraic Expressions

HARDER PRACTICE QUESTIONS

Full marks 34

Write your answers on separate paper. Show your working. Bring like terms together before you add or take them away. To check an answer, put a number in place of each letter.

1 From a story to an expression [4]

Nabin has x marbles. Srijan has twice as many as Nabin, and 3 more. Pema has 1 fewer than Srijan.

i. Write Srijan's and Pema's marbles as expressions.
ii. Write how many marbles the three have together, and simplify it.
iii. If Nabin has 7 marbles, how many do the three have together? Check by counting each one's marbles.

2 Round a rectangle [3]

A rectangle is $2a$ cm long and $a + 3$ cm broad.

i. Write its perimeter as an expression, and simplify it.
ii. Find the perimeter when $a = 5$.

3 Spot the errors [3]

Aisha simplified three expressions. Each answer is wrong. Correct each one, and say what she did wrong.

i. $3x + 2 = 5x$
ii. $4a + 3b = 7ab$
iii. $5y - y = 5$

4 The missing term [3]

Find the missing term in each.

i. $7p + \ldots\ldots - 2p = 9p$
ii. $6m + 3n - \ldots\ldots + n = 2m + 4n$

5 Which are the same? [3]

Which of these expressions are equal to $5x$ for every number x? Explain, and check with $x = 10$.
A: $2x + 3x$; B: $x + x + x + 2x$; C: $6x - x$; D: $3x + 2$; E: $5 + x$.

6 A pyramid of bricks [4]

A pyramid of bricks has three rows: three bricks at the bottom, two in the middle and one on top. Each brick holds the sum of the two bricks under it. The bottom row is $2x$, 5 and $3x$.
Copy and complete the pyramid: the two bricks in the middle row, and the top brick.

i. Write each brick as an expression, simplified.
ii. What is the top brick when $x = 2$?
iii. Check your answer to ii by putting $x = 2$ in the bottom row first and adding up.

7 At the stationery shop [4]

At a shop, a pen costs Rs. p and a notebook costs Rs. n. Bishal buys 3 pens and 2 notebooks. Sadikshya buys 1 pen and 4 notebooks.

i. Write what each of them pays as an expression.
ii. Write what they pay together, simplified.
iii. If a pen costs Rs. 15 and a notebook Rs. 40, who pays more, and by how much?

8 How many terms, really? [3]

Simplify each expression first. Then say whether it is a monomial, a binomial or a trinomial.

i. $4a + 2b - a$

ii. $5x - 2x - 3x + y$

iii. $2p + 3q + p - q + 4$

9 Is it possible? [4]

Give a reason, or an example, for each.

i. Two binomials, added together, make a monomial.

ii. $3x$ and 3 are like terms.

iii. A term has the coefficient 1, but no 1 is written in it.

iv. $2x$ is always bigger than $x + 2$, whatever whole number x is.

10 Think: a number trick [3]

Anisha tells her friends: "Think of a number. Add 3. Add the number you first thought of. Take away 3. Tell me your answer, and I will tell you your number."

i. Write the steps as an expression, with n for the number thought of, and simplify it.

ii. How does Anisha find the number from the answer?

iii. A friend's answer is 46. What was the number?