Unit 15 · Algebraic Expressions

HARDER PRACTICE QUESTIONS · ANSWER KEY

Full marks 34

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 From a story to an expression

ANSWER A · 4

i. Srijan: $2x + 3$. Pema: 1 fewer than that, $2x + 3 - 1 = 2x + 2$.

ii. $x + 2x + 3 + 2x + 2 = 5x + 5$.

iii. $5 \times 7 + 5 = \mathbf{40}$. Check: Nabin 7, Srijan $2 \times 7 + 3 = 17$, Pema $17 - 1 = 16$, and $7 + 17 + 16 = 40$. ✓

MARKING SCHEME

✓ Srijan $2x + 3$, Pema $2x + 2$.

✓ The sum written out.

✓ $5x + 5$.

✓ 40, checked.

2 Round a rectangle

ANSWER A · 3

i. Going round: $2a + a + 3 + 2a + a + 3$. The a terms: $2a + a + 2a + a = 6a$. The numbers: $3 + 3 = 6$. Perimeter $= 6a + 6$ cm.

ii. $6 \times 5 + 6 = 30 + 6 = \mathbf{36\ cm}$. Check: the rectangle is 10 cm by 8 cm, and $2 \times 10 + 2 \times 8 = 36$. ✓

MARKING SCHEME

✓ All four sides added.

✓ $6a + 6$ cm.

✓ 36 cm.

3 Spot the errors

ANSWER U · 3

i. $3x$ and 2 are unlike terms: the 2 has no x. It stays $\mathbf{3x + 2}$. (With $x = 10$: 32, not 50.)

ii. $4a$ and $3b$ are unlike terms, so it stays $\mathbf{4a + 3b}$. They can't be joined into ab.

iii. y is $1y$. $5 - 1 = 4$, so $\mathbf{5y - y = 4y}$. She took away the letter instead of one y.

MARKING SCHEME

✓ i. $3x + 2$, unlike terms.

✓ ii. $4a + 3b$, unlike terms.

✓ iii. $4y$, since y is $1y$.

4 The missing term

ANSWER A · 3

i. $7p - 2p = 5p$, and $9p - 5p = 4p$. The missing term is $\mathbf{4}p$. Check: $7p + 4p - 2p = 9p$. ✓

ii. The n terms already make $3n + n = 4n$, so the missing term has no n. The m terms must go from $6m$ to $2m$, so $\mathbf{4}m$ is taken away. Check: $6m - 4m + 3n + n = 2m + 4n$. ✓

MARKING SCHEME

✓ i. $4p$.

✓ ii. The n terms are already right.

✓ ii. $4m$.

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5 Which are the same?

ANSWER U · 3

A, B and C. A: $2 + 3 = 5$. B: $1 + 1 + 1 + 2 = 5$. C: $6 - 1 = 5$. So each is $5x$.
D and E have a constant that can't join the x term. With $x = 10$: $5x = 50$, A, B and C are 50, but D is 32 and E is 15.

MARKING SCHEME

- ✓ A, B and C, by adding the coefficients.
- ✓ D and E are not, with a reason.
- ✓ Checked with $x = 10$.

6 A pyramid of bricks

ANSWER HA · 4

i. Middle row: $2x + 5$ and $5 + 3x$. Top: $2x + 5 + 5 + 3x = 5x + 10$.
ii. $5 \times 2 + 10 = \mathbf{20}$.
iii. Bottom row 4, 5, 6. Middle row $4 + 5 = 9$ and $5 + 6 = 11$. Top $9 + 11 = \mathbf{20}$. ✓

MARKING SCHEME

- ✓ Middle row $2x + 5$ and $3x + 5$.
- ✓ Top $5x + 10$.
- ✓ 20.
- ✓ The check with numbers gives 20.

7 At the stationery shop

ANSWER A · 4

i. Bishal: Rs. $3p + 2n$. Sadikshya: Rs. $p + 4n$.
ii. $3p + 2n + p + 4n = \mathbf{Rs.\ 4}p \mathbf{+ 6}n$.
iii. Bishal: $3 \times 15 + 2 \times 40 = 45 + 80 =$ Rs. 125. Sadikshya: $15 + 4 \times 40 = 15 + 160 =$ Rs. 175.
Sadikshya pays **Rs. 50** more.

MARKING SCHEME

- ✓ $3p + 2n$ and $p + 4n$.
- ✓ $4p + 6n$.
- ✓ Rs. 125 and Rs. 175.
- ✓ Sadikshya, Rs. 50 more.

8 How many terms, really?

ANSWER U · 3

i. $3a + 2b$: two terms, a **binomial**.
ii. $5x - 2x - 3x = 0$, so only y is left: a **monomial**.
iii. $3p + 2q + 4$: three terms, a **trinomial**.

MARKING SCHEME

- ✓ i. $3a + 2b$, a binomial.
- ✓ ii. y, a monomial.
- ✓ iii. $3p + 2q + 4$, a trinomial.

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9 Is it possible?

ANSWER HA · 4

i. **Yes.** For example $x + 3$ and $2x - 3$: together $x + 3 + 2x - 3 = 3x$. The numbers cancel.
ii. **No.** $3x$ has the variable x, and 3 has no variable. Only the letters decide.
iii. **Yes.** In x, the coefficient is 1: x means $1x$.
iv. **No.** When $x = 1$, $2x = 2$ but $x + 2 = 3$. (When $x = 2$ they are equal, 4 and 4.)

MARKING SCHEME

✓ i. Yes, with an example.
✓ ii. No, 3 has no variable.
✓ iii. Yes, x is $1x$.
✓ iv. No, with a number that shows it.

10 Think: a number trick

ANSWER HA · 3

i. $n + 3 + n - 3 = 2n$. The 3s cancel, so the answer is always **twice the number**.
ii. She **halves** the answer.
iii. $46 \div 2 = \mathbf{23}$. Check: $23 + 3 + 23 - 3 = 46$. ✓

MARKING SCHEME

✓ $n + 3 + n - 3 = 2n$.
✓ She halves the answer.
✓ 23.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	0	9	14	11	**34**

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