Worked solutions | Algebra

Writing expressions with operations and brackets

8 questions | 19 marks

Equivalent correct methods and notation earn corresponding marks. Include units and directions where asked. Each worked step identifies the mark allocation.

1. In $x + 7$, name the variable and the constant term. Is $x + 7$ an expression or an equation? Explain briefly. [3 marks]

x represents the quantity that can vary. (1 mark)

7 is the fixed number added to x. (1 mark)

It is an expression because it describes a calculation without an equality statement. (1 mark)

Answer: Variable: x. Constant term: 7. It is an expression.

2. Let p represent a number. Write expressions for [2 marks]

(a) eight more than p

(b) subtract 6 from p.

(a) Start with p and add 8: $p + 8$. (1 mark)

(b) Start with p and take away 6: $p - 6$. (1 mark)

Answer:

(a) $p + 8$

(b) $p - 6$.

3. Rewrite using usual algebra notation: [3 marks]

(a) $1 \times x$

(b) $5 \times t$

(c) $n \div 4$.

(a) Multiplying by 1 leaves the quantity unchanged; omit the coefficient 1: x. (1 mark)

(b) Put the numerical coefficient before the variable and omit the multiplication sign: $5t$. (1 mark)

(c) Put the quantity being divided above the divisor: $\frac{n}{4}$. (1 mark)

Answer:

(a) x

(b) $5t$

(c) $\frac{n}{4}$.

4. Write expressions for [2 marks]

(a) divide a by 5

(b) divide 5 by a. Assume $a \neq 0$.

(a) a is divided into five equal parts, giving $\frac{a}{5}$. (1 mark)

(b) 5 is the quantity being divided, and a is the divisor, giving $\frac{5}{a}$. (1 mark)

Answer:

(a) $\frac{a}{5}$

(b) $\frac{5}{a}$.

5. Write expressions for [2 marks]

(a) three times the sum of n and 4

(b) four more than three times n.

(a) Form $n + 4$, then multiply the whole sum by 3: $3(n + 4)$. (1 mark)

(b) Form $3n$, then add 4: $3n + 4$. (1 mark)

Answer:

(a) $3(n + 4)$

(b) $3n + 4$.

6. Each of four boxes holds b blue tokens and 2 red tokens. Write an expression for the total number of tokens in all four boxes. Explain your brackets. [2 marks]

One box contains $b + 2$ tokens. (1 mark)

There are four copies of that whole quantity, so the total is $4(b + 2)$. The brackets keep the tokens in one box together. (1 mark)

Answer: $4(b + 2)$ tokens.

7. A ribbon is m centimetres long, where $m > 9$. Cut off 9 centimetres, then divide the remaining ribbon into three equal pieces. Write an expression for the length of one piece. [2 marks]

After the cut, the remaining length is $m - 9$ centimetres. (1 mark)

Divide that whole remaining length by 3: $\frac{m-9}{3}$ centimetres. The fraction bar groups the subtraction. (1 mark)

Answer: $\frac{m-9}{3}$ centimetres.

8. A shopper buys x notebooks at 3 dollars each and y pens at 2 dollars each. The total cost is no more than 20 dollars. Write an expression for the change from 20 dollars, showing how you formed it. [3 marks]

The notebooks cost $3x$ dollars. (1 mark)

The pens cost $2y$ dollars, so the total cost is $3x + 2y$ dollars. (1 mark)

Subtract the whole cost from the amount paid: $20 - (3x + 2y)$ dollars. Accept the equivalent expression $20 - 3x - 2y$. (1 mark)

Answer: $20 - (3x + 2y)$ dollars.

Curriculum alignment

Australian Curriculum, Assessment and Reporting Authority (ACARA) | Australian Curriculum v9.0 | AC9M7A02

Formulating expressions from words and familiar situations, including conventional notation and grouping. Expressions and equations are distinguished, but solving equations, expanding and factorising are not taught in this lesson.

Official curriculum source | Checked 2026-11-02