

2.1 Algebra

Name: _____ Class: _____ Date: _____

KEY WORDS identity

<!-- Session 2 native-skill companion -->

Objective

Practise algebra within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Equations, identities and rearrangement · Foundation

An equation asks which inputs satisfy an equality; an identity holds for all allowed inputs. Preserve equality by applying the same operation to both sides. State restrictions before dividing by a variable.

$$C_1 = 20 + 3x, \quad C_2 = 44 + x, \quad C_1 = C_2$$

$20+3x=44+x$ gives $2x=24$ and $x=12$. Both plans then cost 56. In $A=\pi r^2$, divide by π and take the positive square root to obtain $r=\sqrt{(A/\pi)}$, because r is a length.

Cancelling a term is not the same as cancelling a factor. In $(x^2+2x)/x$, factor the numerator and retain $x \neq 0$. Check a rearrangement by substitution.

Define the unknown and set up a linear equation. Check the answer by substitution. Restrict this Foundation/Core lesson to simple expressions and equations.

■ Equations, identities and rearrangement · Higher

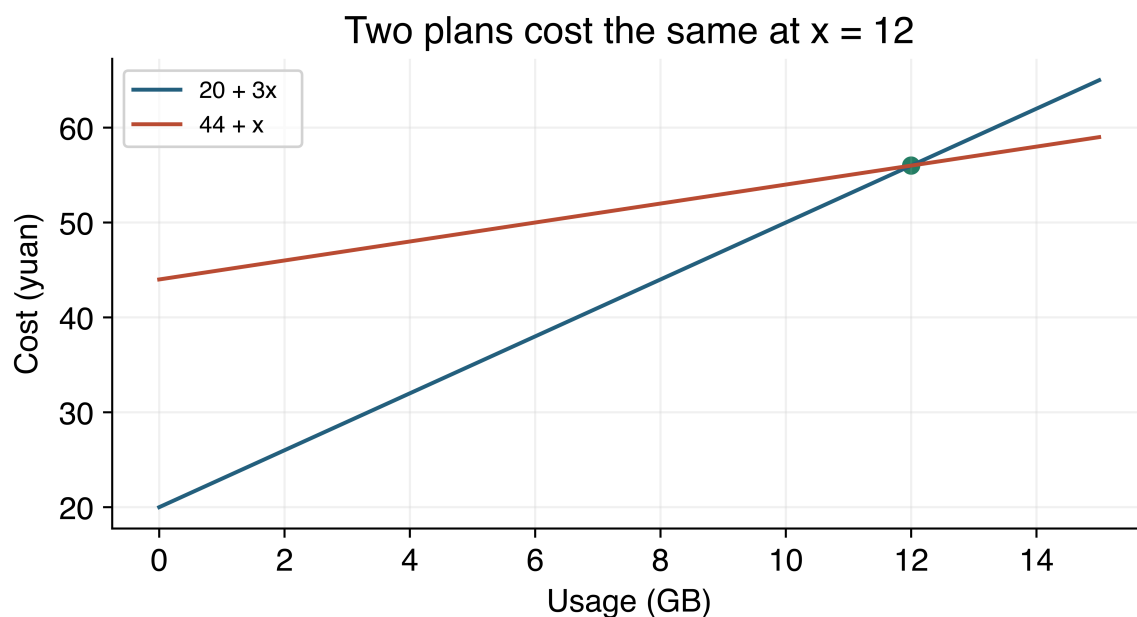
An equation asks which inputs satisfy an equality; an identity holds for all allowed inputs. Preserve equality by applying the same operation to both sides. State restrictions before dividing by a variable.

$$C_1 = 20 + 3x, \quad C_2 = 44 + x, \quad C_1 = C_2$$

$20+3x=44+x$ gives $2x=24$ and $x=12$. Both plans then cost 56. In $A=\pi r^2$, divide by π and take the positive square root to obtain $r=\sqrt{(A/\pi)}$, because r is a length.

Cancelling a term is not the same as cancelling a factor. In $(x^2+2x)/x$, factor the numerator and retain $x \neq 0$. Check a rearrangement by substitution.

Set up the equation from units and the meaning of the unknown. A negative or fractional solution may be algebraically correct but impossible for a count.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Solve $5x - 7 = 18$.

2.2 (Foundation) Solve $2(x + 3) = 18$.

2.3 (Foundation) Find the cost of $20 + 3x$ when $x = 12$.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: Cancelling x from $(x+3)/x$ leaves 3 for every nonzero x .

Solutions

2.1 Add 7 then divide by 5: $x=(18+7)/5=5$.

2.2 Divide by 2 then subtract 3: $x=9-3=6$.

2.3 Substitute the usage: $20+3\times 12=56$.

3.1 False. At $x=2$ the fraction is $5/2$, not 3. Splitting the numerator gives $1+3/x$; cancellation applies to common factors, not terms in a sum.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.