CHARTA LEARNING · LESSON NOTES

Algebra: expressions and equations

Quantitative Reasoning

1 A story: the same thing, dressed differently

- 3 packs of pens + 3 packs of pencils
- = 3 × (one pack of each)
- Same value, different costume
- Expression: no equals sign, only rewrite

IN THE LESSON

- Imagine two ways to say the same price.
- A shop says, three packs of pens plus three packs of pencils.
- Another says, three times the total of one pack of each.
- Same cost, different costume.
- Algebra is the skill of changing the costume without changing the value.
- A letter such as x just stands for a number we do not know yet, or a number that can vary.
- An expression is a bundle of letters, numbers and signs, like three x plus six.
- It has no equals sign, so there is nothing to solve.
- You can only rewrite it.
- The exam rewards whoever picks the costume that makes the question easy.

2 Expanding: everything times everything

- 2(x + 5) = 2x + 10
- Every term inside gets multiplied
- Two brackets: 2 × 2 = 4 products
- Then combine like terms

IN THE LESSON

- The first rewrite is expanding, which means multiplying out brackets.
- The rule underneath is the distributive property: a number outside a bracket multiplies every term inside.
- Two times the bracket x plus five gives two x plus ten, not two x plus five.
- When two brackets meet, every term in the first multiplies every term in the second.
- A handy memory is first, outer, inner, last, but the real idea is simply that nothing is skipped.
- If a bracket has two terms and the other has two, you will write four products, then tidy up by combining like terms, the terms with the same letter part.
- Watch the signs: a minus times a minus makes a plus.

3 Example 1: expanding two brackets

Expand (x + 2)(x − 5)

First × first	x · x	**x²**
Outer + inner	−5x + 2x	**−3x**
Last × last	2 × (−5)	**−10**
Result	check with x = 7: 18	**x² − 3x − 10**

IN THE LESSON

- Let us expand x plus two, times x minus five.
- First times first: x times x is x squared.
- Outer: x times minus five is minus five x.
- Inner: two times x is plus two x.
- Last: two times minus five is minus ten.
- Now combine the like terms: minus five x and plus two x make minus three x.
- The result is x squared minus three x minus ten.
- A quick check, which takes seconds: let x be seven.
- The brackets give nine times two, which is eighteen.
- The expanded form gives forty-nine, minus twenty-one, minus ten, which is eighteen.
- They agree.
- Plugging in a simple number is the best safety net in algebra.

4 Pattern one: a sum, squared

$(a + b)^2 = a^2 + 2ab + b^2$

a squared	Square the first
Twice a times b	Twice the cross product
b squared	Square the second

IN THE LESSON

- Now three patterns worth memorising, because the exam uses them constantly.
- The first is a sum, squared.
- A sum squared equals a squared, plus twice a times b, plus b squared.
- Here a and b are any two numbers or expressions.
- The first and last terms are the squares of each.
- The middle term is the one students forget.
- It comes from the two cross products, a times b and b times a.
- Picture a square whose side is a plus b.
- It is cut into a big square a by a, a small square b by b, and two matching rectangles a by b.
- Leave the rectangles out and you have lost part of the area.

5 Check it with numbers

a = 3 and b = 4

Expression	Value
$(a + b)^2 = 7^2$	49
$a^2 + b^2$ (the wrong version)	25
2ab, the missing part	24
$a^2 + 2ab + b^2$	49

IN THE LESSON

- A number test shows the middle term is not optional.
- Let a be three and b be four.
- The sum is seven, and seven squared is forty-nine.
- Now the tempting wrong version: three squared plus four squared is nine plus sixteen, which is only twenty-five.
- The gap is twenty-four, and that is exactly twice three times four, the missing middle term.
- Add it back and nine, plus twenty-four, plus sixteen, gives forty-nine again.
- The same check works for a difference squared, where the middle term is minus two a b: three minus four is minus one, and its square is one, which is nine plus sixteen minus twenty-four.
- Whenever you doubt a pattern, test it with small numbers.

6 Pattern two: a difference of squares

$(a + b)(a - b) = a^2 - b^2$

Sum, a + b	A sum...
Difference, a − b	...times the matching difference
Product of both	Gives the difference of squares

IN THE LESSON

- The second pattern, and the most useful on the exam, is the difference of squares.
- A sum times a difference equals a squared minus b squared.
- Read it in both directions.
- Going right, two brackets collapse into two terms, because the cross products cancel: plus a b and minus a b add to zero.
- Going left, whenever you see one square minus another square, you can split it into a sum times a difference.
- Sixteen is four squared and nine is three squared, so sixteen minus nine splits into seven times one.
- The speed trick is this.
- If you know the sum and the difference of two numbers, you know a squared minus b squared at once, and you never have to find a or b.

7 Example 2: factoring a quadratic

Factor $x^2 - 7x + 12$

Common factor first?	none here	**skip**
Need product +12, sum −7	both negative: −3 and −4	**−3, −4**
Write the factors	$x^2 + (-3-4)x + 12$	**(x−3) (x−4)**
Check by expanding	$-4x - 3x + 12$	**$x^2 - 7x + 12$**

IN THE LESSON

- Factoring is expanding run backwards.
- Always begin by taking out any common factor.
- Then, for x squared plus b x plus c, hunt for two numbers whose product is c and whose sum is b.
- Take x squared minus seven x plus twelve.
- The product is plus twelve, so the two numbers have the same sign.
- The sum is minus seven, so both are negative.
- Pairs that multiply to twelve are one and twelve, two and six, three and four.
- Minus three and minus four add to minus seven.
- So the factors are x minus three, times x minus four.
- Check by expanding: minus four x and minus three x make minus seven x, and minus three times minus four is plus twelve.

8 Example 3: factor, cancel, substitute

Value of $(2x^2 - 8x) \div (x^2 - 16)$ at $x = 46$

Top: take out 2x	$2x^2 - 8x$	**2x(x − 4)**
Bottom: difference of squares	$x^2 - 16$	**(x+4) (x−4)**
Cancel the common bracket	(x − 4) top and bottom	**2x ÷ (x + 4)**
Put in x = 46	92 ÷ 50	**1.84**

IN THE LESSON

- Here is a typical exam move.
- For x not equal to four or minus four, find two x squared minus eight x, divided by x squared minus sixteen, when x is forty-six.
- The slow way squares forty-six, which is two thousand one hundred and sixteen, and then divides.
- The fast way factors first.
- On top, take out two x: two x times x minus four.
- On the bottom, sixteen is four squared, so it is a difference of squares: x plus four, times x minus four.
- The bracket x minus four appears top and bottom, so it cancels.
- We are left with two x over x plus four.
- Put in forty-six: ninety-two over fifty, which is one point eight four.

9 Example 4: the sum and difference shortcut

$a^2 - b^2 = 45$ and $a + b = 9$. Find $3(a - b)$.

Spot the pattern	$a^2 - b^2 = (a + b)(a - b)$	**pattern**
Put in what is known	$45 = 9 \times (a - b)$	
Divide	$a - b = 45 \div 9$	**5**
Answer: $3(a - b)$	3×5	**15**

IN THE LESSON

- Now a trap question dressed as a hard one.
- If a squared minus b squared is forty-five, and a plus b is nine, what is three times a minus b?
- The tempting route is to solve for a and b, which wastes time.
- Instead spot the pattern: a squared minus b squared equals a plus b, times a minus b.
- So forty-five equals nine times a minus b.
- Divide, and a minus b is five.
- The question asks for three times that, so the answer is fifteen.
- Notice the last step: the question asked for three times the difference, not the difference itself.
- That slip is the usual wrong answer, and it will be sitting there in the choices as five.

10 Example 5: squares without solving

$a^2 + b^2 = 29$ and $ab = 10$. Find $(a + b)^2$.

Expand $(a + b)^2$	$a^2 + 2ab + b^2$	**pattern**
Swap in the given	$29 + 2 \times 10$	**49**
Same idea: $(a - b)^2$	$29 - 2 \times 10$	**9**
Proof: $a = 5$, $b = 2$	7^2 and 3^2	**49 and 9**

IN THE LESSON

- One more, using the first pattern the other way round.
- Suppose a squared plus b squared is twenty-nine, and a times b is ten.
- What is a plus b, all squared?
- Expand it: a squared, plus two a b, plus b squared.
- Swap in what we know: twenty-nine plus two times ten, which is forty-nine.
- And a minus b, all squared, is twenty-nine minus twenty, which is nine.
- We never found a or b.
- If you want proof, a is five and b is two: seven squared is forty-nine, three squared is nine.
- Questions like this are built so that the middle term is the missing piece, and the fastest solvers see that within seconds.

11 Mistakes mid-lesson: expressions

- $(a + b)^2$ is not $a^2 + b^2$
- $2(x + 5)$ is $2x + 10$, not $2x + 5$
- Cancel factors, never single terms
- A minus before a bracket flips every sign

IN THE LESSON

- Let us stop and collect the traps from this half.
- One: writing a plus b, all squared, as a squared plus b squared.
- The middle term is gone.
- Two: distributing to only the first term, so two times x plus five becomes two x plus five.
- Three: cancelling terms instead of factors.
- In x plus four, over four, you cannot cancel the fours, because the top is a sum.
- You may cancel only something that multiplies the whole top and the whole bottom, which is why we factor first.
- Four: sign slips with minus signs in front of brackets.
- A minus in front flips every sign inside.
- When in doubt, test a small number.

12 A story: the balance scale

- An equation is a balanced scale
- Do the same to both sides
- Linear: x only, never x^2
- Goal: x alone on one side

IN THE LESSON

- Now equations.
- Picture an old balance scale with a mystery weight on one side.
- You know it balances, so the two sides weigh the same.
- You may add or remove the same amount from both pans, or double or halve both, and it still balances.
- That is exactly what you do with an equation.
- An equation says two things are equal, and the equals sign is the pivot.
- A linear equation is one where the unknown appears only to the first power: x, but never x squared.
- Your aim is to get x alone on one side.
- Whatever you do to one side, you do to the other, and each move should bring x closer to being alone.

13 The routine for one unknown

Tidy up

Clear fractions → Expand brackets → Combine like terms

Isolate x

x terms one side → Divide by the coefficient → Check in the original

IN THE LESSON

- Here is a routine that works every time, and a tidy order keeps you accurate when there is no calculator.
- Top row, tidy up.
- If there are fractions, multiply every term by the common denominator to clear them.
- Then expand any brackets and combine like terms on each side.
- Bottom row, isolate.
- Move the terms with x to one side and the plain numbers to the other, remembering that a term changes sign when it crosses the equals sign.
- Divide both sides by the number in front of x.
- Last, check the answer in the original equation, not in your tidied one.
- That final check catches slips in the middle, and it takes ten seconds.

14 Example 6: brackets on both sides

Solve $4(x - 2) = x + 7$

Clear the bracket	$4x - 8 = x + 7$	
x terms left, numbers right	$4x - x = 7 + 8$	**$3x = 15$**
Divide by 3	$x = 15 \div 3$	**5**
Check in the original	$4(5-2) = 12$; $5+7 = 12$	**ok**

IN THE LESSON

- Solve four times x minus two, equals x plus seven.
- Start by clearing the bracket.
- Four times x is four x, and four times minus two is minus eight, so we have four x minus eight, equals x plus seven.
- Notice we multiplied both terms, not just the first.
- Now bring the x terms together: subtract x from both sides, which leaves three x minus eight, equals seven.
- Add eight to both sides: three x equals fifteen.
- Divide by three, and x is five.
- Check in the original: four times three is twelve, and five plus seven is twelve.
- The check is on the left, using the original bracket, so a sign slip would show up immediately.

15 Example 7: fractions

Solve (x + 1)/3 + (x − 1)/2 = 4

Multiply every term by 6	2(x+1) + 3(x−1) = 24	
Expand and combine	2x+2+3x−3 = 24	**5x − 1 = 24**
Solve	5x = 25	**x = 5**
Check: 2 + 2	6 ÷ 3 + 4 ÷ 2	**4**

IN THE LESSON

- When fractions appear, clear them first.
- Solve x plus one over three, plus x minus one over two, equals four.
- The denominators are three and two, so the smallest number both divide into is six.
- Multiply every term by six.
- The first fraction becomes two times x plus one.
- The second becomes three times x minus one.
- And four becomes twenty-four.
- Expand: two x plus two, plus three x minus three, equals twenty-four.
- Combine: five x minus one equals twenty-four.
- So five x is twenty-five, and x is five.
- A common slip is to multiply only the fractions by six and forget the right-hand side.
- Multiply everything or nothing, and the scale stays balanced.

16 Two unknowns need two equations

- One equation, two unknowns: endless answers
- Substitution: replace one letter
- Elimination: add or subtract to cancel one
- Find one letter, then back-substitute

IN THE LESSON

- What if there are two unknowns, say x and y?
- A single equation, such as x plus y equals ten, has endless answers: one and nine, two and eight, and so on.
- To pin down both, you need a second equation, and together they form a system.
- Think of two clues about two mystery numbers.
- There are two standard ways to use them.
- Substitution: solve one equation for one letter, then put that expression into the other.
- Elimination: add or subtract the equations so that one letter cancels, leaving one equation with one unknown.
- Either way, once you have found one letter, you put it back in to find the other.

17 Two lines, one crossing

Chart: Value of y vs Value of x

- x + y = 10
- x − y = 2
- x = 6, y = 4

IN THE LESSON

- Here is what solving a system really means.
- The horizontal axis is the value of x and the vertical axis the value of y.
- The equation x plus y equals ten is a straight line, falling from ten on the y axis to ten on the x axis.
- Every point on it is a pair that adds to ten.
- The second equation, x minus y equals two, is a rising line.
- Every point on it is a pair with a difference of two.
- Only one point lies on both lines, where they cross, at x equals six and y equals four.
- That crossing is the solution.
- Parallel lines never meet, so a system like that has no solution.

18 Example 8: substitution

y = 2x − 1 and 3x + y = 14

Replace y in the second	3x + (2x − 1) = 14	**5x − 1 = 14**
Solve for x	5x = 15	**x = 3**
Back-substitute for y	y = 2(3) − 1	**y = 5**
Check: 3x + y	9 + 5	**14**

IN THE LESSON

- Substitution shines when one equation already has a letter alone.
- Here y equals two x minus one, and three x plus y equals fourteen.
- The first equation tells us what y is, so we put two x minus one wherever y appears in the second.
- That gives three x plus the bracket two x minus one, equals fourteen.
- Keep the bracket, because it protects the sign.
- Combine: five x minus one equals fourteen.
- So five x is fifteen, and x is three.
- Now back-substitute into the easy equation: y is two times three, minus one, which is five.
- Check in the other one: three times three is nine, plus five is fourteen.
- Both equations are happy.

19 Example 9: elimination

3x + 2y = 16 and 5x − 2y = 16

Add: the y terms cancel	8x = 32	**x = 4**
Back-substitute	12 + 2y = 16	**y = 2**
Check in the second	5(4) − 2(2)	**16**

IN THE LESSON

- Elimination is usually quicker when the letters are lined up.
- Take three x plus two y equals sixteen, and five x minus two y equals sixteen.
- Look at the y terms: plus two y and minus two y.
- They are opposites, so if we add the equations, y vanishes.
- Three x plus five x is eight x, and sixteen plus sixteen is thirty-two.
- So eight x equals thirty-two, and x is four.
- Put x back into the first equation: twelve plus two y equals sixteen, so two y is four and y is two.
- Check in the second: twenty minus four is sixteen.
- The rule: if the matching terms have opposite signs, add; if the same sign, subtract.

20 Example 10: make the terms match first

4x + 3y = 27 and 3x + 5y = 34

First × 3	12x + 9y = 81	
Second × 4	12x + 20y = 136	
Subtract	11y = 55	**y = 5**
Back-substitute	4x + 15 = 27	**x = 3**

IN THE LESSON

- Sometimes no letter lines up.
- Take four x plus three y equals twenty-seven, and three x plus five y equals thirty-four.
- To cancel x, make both x terms the same size.
- Multiply the whole first equation by three, giving twelve x plus nine y equals eighty-one.
- Multiply the whole second by four, giving twelve x plus twenty y equals one hundred and thirty-six.
- Now the x terms match and have the same sign, so subtract the first from the second: eleven y equals fifty-five, and y is five.
- Back in the first: four x plus fifteen is twenty-seven, so x is three.
- Multiply every term of an equation, including the number on the right.
- That is where slips happen.

21 Example 11: when the question asks for a combination

5x + 3y = 29 and 3x + 5y = 27. Find x + y.

Add the equations	8x + 8y = 56	
Divide by 8	x + y = 7	**answer**
Bonus: subtract	2x − 2y = 2	**x − y = 1**
Proof: x = 4, y = 3	20 + 9; 12 + 15	**29; 27**

IN THE LESSON

- Here is the exam shortcut mentioned in the notes.
- Five x plus three y equals twenty-nine, and three x plus five y equals twenty-seven.
- What is x plus y?
- Do not solve for x and y.
- Add the two equations: eight x plus eight y equals fifty-six.
- Divide everything by eight, and x plus y is seven.
- Done in two lines.
- If instead they asked for x minus y, subtract the equations: two x minus two y equals two, so x minus y is one.
- Check with the actual values, x equals four and y equals three: twenty plus nine is twenty-nine, twelve plus fifteen is twenty-seven.
- Before you start eliminating, read what is being asked.
- A sum or a difference is often hiding in plain sight.

22 Word problems: words to algebra

Translate before you solve

Words	Algebra
5 more than x	x + 5
5 less than x	x − 5
twice the sum of x and 3	2(x + 3)
x is 20% of y	x = 0.2y

IN THE LESSON

- Now the story problems.
- The set-up is the hard part, and the maths is usually easy.
- Step one: name each unknown with a clear letter, written down with its meaning, such as a for adult tickets.
- Step two: translate sentence by sentence.
- Is, was and equals become an equals sign.
- Of after a fraction or percent means times.
- More than adds, less than subtracts, and watch the order: five less than x is x minus five, not five minus x.
- Twice the sum of x and three needs a bracket, because the doubling applies to the whole sum.
- Step three: ask what is being asked.
- Circle it.
- Solving is not the end if the question wants something else.

23 Example 12: tickets (set-up)

Adults $12, children $7; 40 tickets, $395 in all. How many adults?

Adult tickets	name it	**a**
Child tickets	name it	**c**
Count sentence	tickets	**a + c = 40**
Money sentence	dollars	**12a + 7c = 395**

IN THE LESSON

- A theatre sells adult tickets at twelve dollars and child tickets at seven dollars.
- In all, forty tickets are sold for three hundred and ninety-five dollars.
- How many adult tickets were sold?
- Name the unknowns: a for adult tickets, c for child tickets.
- Two facts, so two equations.
- The count: a plus c equals forty.
- The money: twelve a plus seven c equals three hundred and ninety-five.
- A good habit is to check units on each equation.
- The first counts tickets, the second counts dollars, so each term in the second is price times number of tickets, in dollars.
- Mixing them up is a classic slip.
- The question asks for adults, so a is our target.

24 Example 12: tickets (solve)

12a + 7(40 − a) = 395

Distribute the 7	12a + 280 − 7a = 395	**5a + 280 = 395**
Solve	5a = 115	**a = 23**
Children	c = 40 − 23	**17**
Check the money	276 + 119	**395**

IN THE LESSON

- Now solve by substitution.
- From the count, c equals forty minus a.
- Put that in the money equation: twelve a plus seven times the bracket forty minus a, equals three hundred and ninety-five.
- Distribute the seven to both terms: seven times forty is two hundred and eighty, and seven times minus a is minus seven a.
- So twelve a minus seven a is five a, and we have five a plus two hundred and eighty equals three hundred and ninety-five.
- Subtract two hundred and eighty: five a equals one hundred and fifteen.
- So a is twenty-three adult tickets.
- The children are forty minus twenty-three, which is seventeen.
- Check the money: two hundred and seventy-six plus one hundred and nineteen is three hundred and ninety-five.

25 Example 13: the trap, answer the question

r = 2m + 4 and r + m = 31. Ravi's age in 5 years?

Translate	r = 2m + 4	**r + m = 31**
Substitute	3m + 4 = 31	**m = 9**
Ravi now	2(9) + 4	**22**
Asked: Ravi in 5 years	22 + 5	**27**

IN THE LESSON

- Here is a problem where the algebra is easy and the trap is the last line.
- Ravi is four years older than twice Mia's age.
- Their ages add up to thirty-one.
- How old will Ravi be in five years?
- Let r be Ravi's age and m be Mia's.
- Four years older than twice Mia's age gives r equals two m plus four.
- The sum gives r plus m equals thirty-one.
- Substitute: three m plus four equals thirty-one, so three m is twenty-seven and m is nine.
- Ravi is two times nine, plus four, which is twenty-two.
- But the question asks for his age in five years: twenty-seven.
- Twenty-two will be sitting in the choices, ready for anyone who stops one line early.

26 The fastest path: back-solve

Choices for adults: 17, 20, 23, 25, 28. Test the middle one.

Start at the middle: 23 adults	23 × 12	**$276**
Children: 40 − 23 = 17	17 × 7	**$119**
Total money	276 + 119	**$395**
Matches the question	choice C	**done**

IN THE LESSON

- There is a fast route that needs no equations: work back from the answer choices.
- Return to the tickets.
- Suppose the five choices for adult tickets are seventeen, twenty, twenty-three, twenty-five and twenty-eight.
- On the exam, choices are listed in order, so start with the middle one.
- Try twenty-three adults.
- That is two hundred and seventy-six dollars.
- The other seventeen tickets are children at seven dollars: one hundred and nineteen.
- The total is three hundred and ninety-five, which matches, so choice C is correct on the first try.
- If the total had been too high, you would know to try fewer adults, and you would only need a second test.
- Use this when the numbers are tidy and the equations look messy.

27 Choosing a method

Two equations

Letter already alone? → Yes: substitute → No: eliminate

First, read the ask

Combination asked? → Add or subtract → Else back-solve

IN THE LESSON

- To finish this half, here is the decision you make in the first few seconds.
- If you have two equations, look at them.
- Is one letter already alone, or easy to isolate?
- Then substitute.
- If the letters line up in matching columns, eliminate, multiplying one or both equations first if needed.
- Second row: before any of that, read the question.
- If it asks for a combination such as x plus y, x minus y, or two x plus two y, try adding or subtracting the equations and dividing.
- If the numbers are tidy and the choices are ordered, consider back-solving from the middle choice.
- The best method is the one that finishes the question in under two minutes, with a check at the end.

28 Mistakes: equations and word problems

- Distribute to every term inside
- Signs flip when a term crosses the equals sign
- Multiply every term, including the right side
- Answer what was asked: circle it first
- 5 less than x is x − 5, not 5 − x

IN THE LESSON

- The traps for this half.
- One: distributing to only the first term, so seven times forty minus a becomes two hundred and eighty minus a.
- Two: dropping a sign when a term crosses the equals sign.
- Three: multiplying only the left side when you clear fractions, or only some equations in elimination.
- Four: reporting the wrong variable, giving Ravi's age now when the question asked about five years on, or the children when it asked for adults.
- Five: translating five less than x as five minus x.
- Last, always check.
- Substitute your answer in the original words of the problem, not just the equation, because the equation itself might be mis-set.
- A wrong set-up gives a clean wrong answer.

29 Recap: the rules

$(a \pm b)^2 = a^2 \pm 2ab + b^2$ $(a+b)(a-b) = a^2 - b^2$

Squared pattern	Square both ends, keep the middle
Sum × difference	$= a^2 - b^2$
Factoring	Product c, sum b; cancel factors
One unknown	Tidy, collect, divide, check
Two unknowns	Substitute or eliminate

IN THE LESSON

- Let us recap.
- A sum squared is a squared, plus twice a b, plus b squared, and a difference squared has a minus in the middle.
- A sum times a difference is a squared minus b squared, which lets you skip solving for individual letters.
- Factoring a quadratic means two numbers with the right product and sum, after taking out any common factor.
- Only cancel factors, never terms.
- For one unknown, tidy up, collect, divide, and check.
- For two unknowns, substitute when a letter is alone, eliminate when they line up, and add or subtract when the question asks for a combination.
- For word problems, name the unknowns, translate, solve, and answer what was asked.

30 Try three quick questions

1. Expand $(x + 3)(x − 4)$.
   Answer: $x^2 − x − 12$
2. $a + b = 6$ and $a^2 − b^2 = 30$. Find $a − b$.
   Answer: $30 ÷ 6 = 5$
3. $3x + y = 11$ and $x + y = 5$. Find x.
   Answer: Subtract: $2x = 6$, so $x = 3$

IN THE LESSON

- Now try three quick questions.
- Pause after each.
- Question one.
- Expand x plus three, times x minus four.
- The answer is x squared minus x minus twelve, since three x minus four x is minus x.
- Question two.
- If a plus b is six, and a squared minus b squared is thirty, what is a minus b?
- Thirty divided by six is five.
- Question three.
- If three x plus y is eleven, and x plus y is five, what is x?
- Subtract the second equation from the first: two x equals six, so x is three, and y is two.
- Well done.
- If any of those felt slow, go back to the matching example and try the problem again on paper.