

ALGEBRA

A Puzzle

What is the missing number?

$$\square - 2 = 4$$

OK, the answer is 6, right? Because $6 - 2 = 4$. Easy stuff.

Well, in Algebra we don't use blank boxes, we use a **letter** (usually an x or y, but any letter is fine). So we write:

$$x - 2 = 4$$

It is really that simple. The letter (in this case an x) just means "we don't know this yet", and is often called the **unknown** or the **variable**.

And when we solve it we write:

$$x = 6$$

How to Solve

Algebra is just like a puzzle where we start with something like " $x - 2 = 4$ " and we want to end up with something like " $x = 6$ ".

But instead of saying "*obviously* $x=6$ ", use this neat step-by-step approach:

- Work out **what to remove** to get " $x = \dots$ "
- Remove it by **doing the opposite** (adding is the opposite of subtracting)
- Do that to **both sides**

Name

Date



SOLVE THE EQUATION SHEET 3

Calculate the value of each expression given the value of the variables.

	SOLVE	WORKING	ANSWER
1)	$4a=20$		$a=5$
2)	$b-7=8$		$b=$
3)	$2c-1=11$		$c=$
4)	$10=d+6$		$d=$
5)	$18=3e$		$e=$
6)	$f-7=4+4$		$f=$
7)	$2g=7-5$		$g=$
8)	$16-2h=0$		$h=$
9)	$2(i+1)=18$		$i=$
10)	$3(j-1)=21$		$j=$
11)	$5(k+2)=45$		$k=$
12)	$4(l-6)=16$		$l=$
13)	$2m-5=11$		$m=$
14)	$\frac{1}{2}n+1=8$		$n=$
15)	$20 \div o = 4$		$o=$
16)	$p \div 7=3$		$p=$
17)	$q/6=5$		$q=$
18)	$4(r+2)=24$		$r=$
19)	$20=5(s-3)$		$s=$
20)	$\frac{1}{2}t + 7=13$		$t=$
21)	$u^2=36$		$u=$
22)	$v^2=100$		$v=$
23)	$w=\sqrt{25}$		$w=$
24)	$3x=20-8$		$x=$
25)	$18-4y=2$		$y=$

Unknown Variables in Equations (A)

Name: _____

Date: _____

Determine the value of each variable.

1. $9 \times n = 45$

2. $p = 24 \div 6$

3. $15 - x = 9$

4. $14 \div 7 = m$

5. $h \div 1 = 8$

6. $4 = v \div 6$

7. $48 = 8 \times b$

8. $y + 5 = 12$

9. $56 \div 8 = k$

10. $j \div 5 = 3$

11. $72 \div 8 = d$

12. $2 = 12 \div z$

13. $10 \div t = 5$

14. $2 = 1 \times a$

15. $3 = 8 - w$

16. $c = 7 + 2$

17. $r = 10 \div 5$

18. $f + 9 = 10$

19. $7 + g = 12$

20. $18 = s \times 6$

Name

Date



ALGEBRA WORD PROBLEMS SHEET 2

Write the algebraic expression for each word problem.

See if you can spot the trick problem that doesn't need algebra!

1)	In a stable, there are h horses. 6 of them are taken out into the yard to exercise. How many are left in the stable?	= $h-6$
2)	There are c cyclists in a cycle race. $\frac{3}{4}$ of the cyclists finish the race. How many cyclists did not finish?	=
3)	There are 56 people on a bus. t people get off at the next stop and 3 more people get on. How many people are on the bus now?	=
4)	In a class of 30 children, there are g girls. What fraction of the class are girls?	=
5)	In a class of c children, there are 16 boys. What fraction of the class are boys?	=
6)	There are b people on a bus. At the next stop, 7 people get off and 10 more get on. How many more people are on the bus now?	=
7)	I cut a long piece of wood into 50cm pieces. I manage to cut w pieces of wood, and there is 20cm left over. How long was the wood to start with?	=
8)	I have c chocolates which I share equally between by 5 friends. How many do they each get?	=
9)	I have 5 pens already. I am given 2 packs of pens. Each pack contains t pens. How many pens do I have now?	=
10)	There are d deer and p pheasants in the woods. How many legs in total?	=