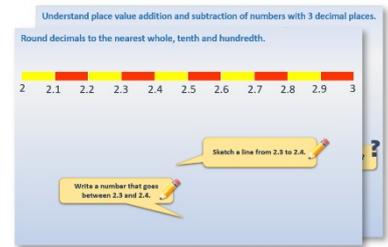


Week 7, Day 3

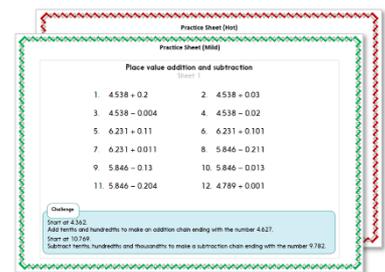
Solving equations

Each day covers one maths topic. It should take you about 1 hour or just a little more.

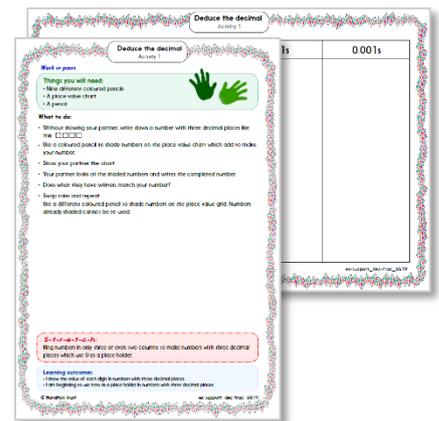
1. Start by reading through the **Learning Reminders**. They come from our *PowerPoint* slides.



2. Tackle the questions on the **Practice Sheet**. There might be a choice of either **Mild** (easier) or **Hot** (harder)! Check the answers.



3. Finding it tricky? That's OK... have a go with a grown-up at **A Bit Stuck?**



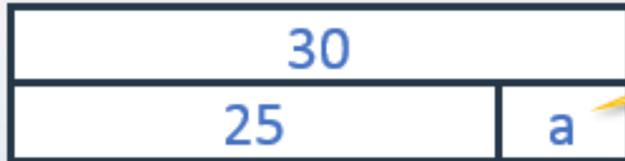
4. Think you've cracked it? Whizzed through the Practice Sheets? Have a go at the **Investigation**...

Learning Reminders

Express missing number problems algebraically.

$$25 + a = 30$$

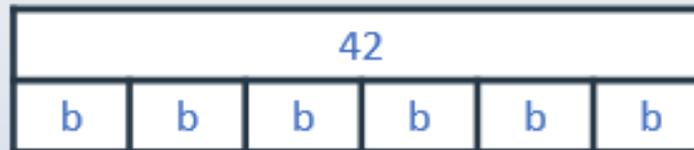
This is called an **equation** and 'a' stands for a **mystery number**.



? What is a?
5

$$6b = 42$$

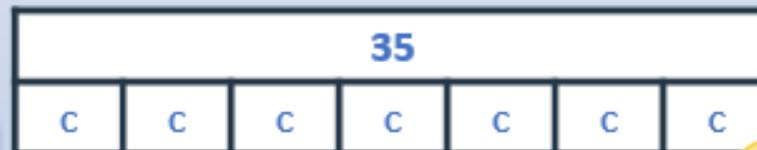
? What is b?



If 6 times something is 42, then the something must be... 7

$$35 \div c = 7$$

? What is c?



We can think of this as 7 lots of something makes 35, so c is... 5.

Learning Reminders

Express missing number problems algebraically.



This one needs a bit of working out first.

$$3e + 1 = 18 - 5$$

$$3e + 1 = 13$$

$$3e = 12$$

$$\text{So } e = 4$$

Which part can we work out first?

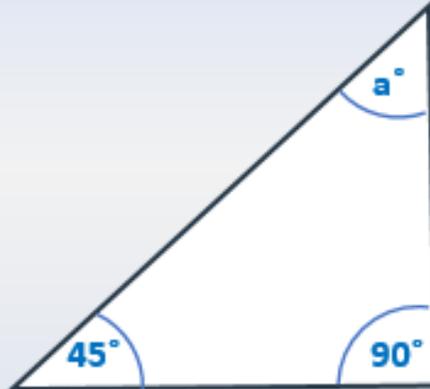
The = sign acts like the balance point in the middle of a see saw...
To keep it balanced, we must change one side of the balance by the same amount as the other. So, if we subtract 1 from one side of the = sign, we must do the same to the other.

$$3 \times 5 = 17 - d$$

First, we need to calculate 3×5 .
 $15 = 17 - d$, so d must be...?

Learning Reminders

Express missing number problems algebraically.

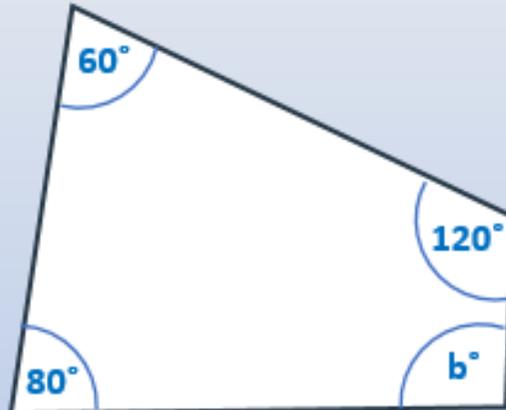


What is the total of the angles inside a triangle?
How can we find a? ?

$$90^\circ + 45^\circ + a^\circ = 180^\circ$$

$$135^\circ + a^\circ = 180^\circ$$

$$\text{So } a = 45^\circ$$



What is the total of the angles inside a quadrilateral?
How can we find b? ?

$$80^\circ + 60^\circ + 120^\circ + b^\circ = 360^\circ$$

$$260^\circ + b^\circ = 360$$

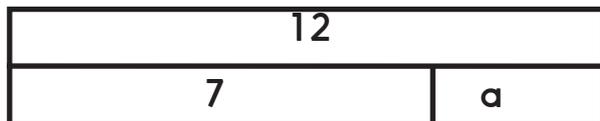
$$\text{So } b = 100^\circ$$

Practice Sheet Mild

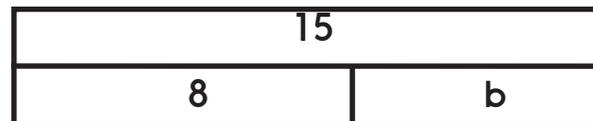
Solving equations

Solve these equations:

1. $7 + a = 12$



2. $15 - b = 8$



3. $2c = 24$



4. $d - 2 = 18$



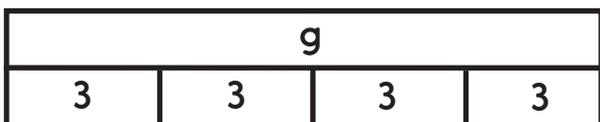
5. $e + 10 = 23$



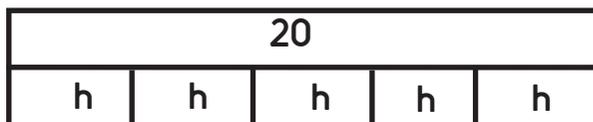
6. $4f = 24$



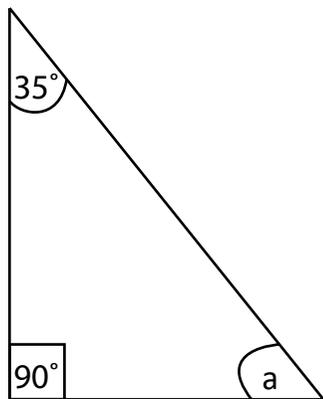
7. $g \div 3 = 4$



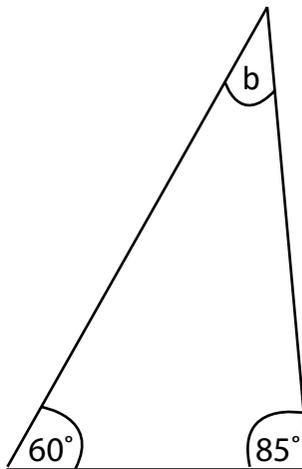
8. $20 \div h = 5$



9. $90^\circ + 35^\circ + a = 180^\circ$



10. $60^\circ + 85^\circ + b = 180^\circ$



Practice Sheet Hot

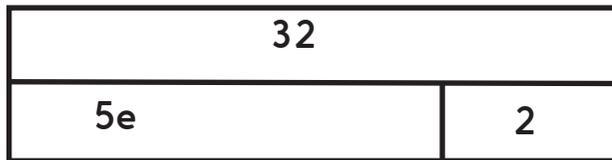
Solving equations

Solve these equations:

1. $15 - a = 7$

3. $4c = 48$

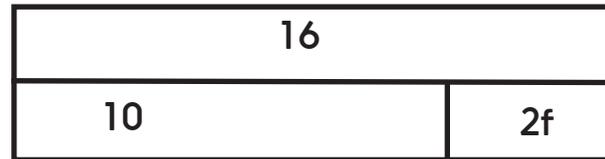
5. $5e + 2 = 32$



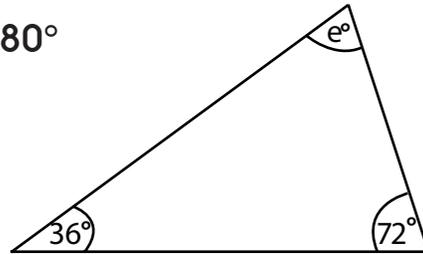
2. $8 + b = 13$

4. $90 \div d = 3$

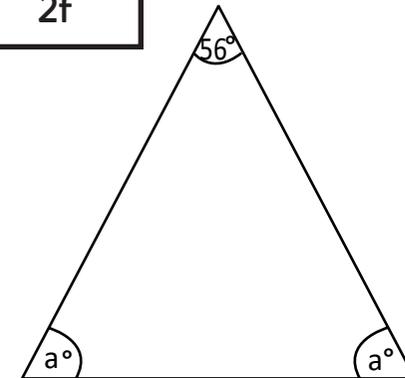
6. $10 + 2f = 16$



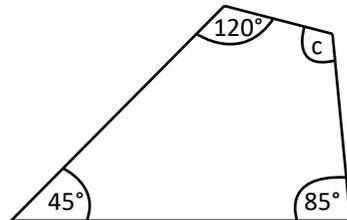
7. $72^\circ + 36^\circ + e = 180^\circ$



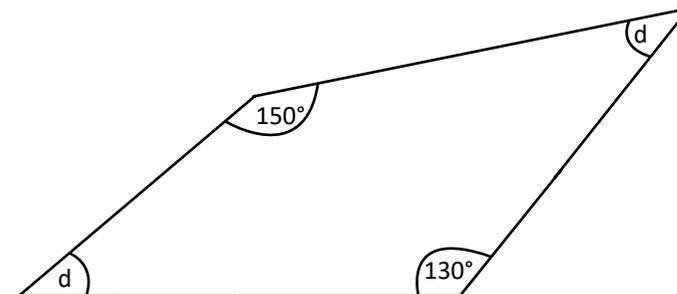
8. $56^\circ + 2a = 180^\circ$



9. $45^\circ + 85^\circ + 120^\circ + c = 360^\circ$



10. $130^\circ + 150^\circ + 2d = 360^\circ$



Practice Sheets Answers

Solving equations (mild)

1. $a = 5$
2. $b = 7$
3. $c = 12$
4. $d = 20$
5. $e = 13$
6. $f = 6$
7. $g = 12$
8. $h = 4$
9. $a = 55^\circ$
10. $b = 35^\circ$

Solving equations (hot)

1. $a = 8$
2. $b = 5$
3. $c = 12$
4. $d = 30$
5. $e = 6$
6. $f = 3$
7. $e = 72^\circ$
8. $a = 62^\circ$
9. $c = 110^\circ$
10. $d = 40^\circ$

A Bit Stuck? Mystery calculations

$27 + \square = 30$

$\square \times 5 = 35$

$\square - 35 = 65$

$45 \div \square = 9$

We can rewrite these mystery calculations with letters instead of empty boxes.

$27 + a = 30$

$b \times 5 = 35$

$c - 35 = 65$

$45 \div d = 9$

The letters just stand for mystery numbers. We've used a different letter in each number sentence so we don't get confused.

Let's solve the equations (number sentences) to find what each letter stands for, e.g.

$94 + \square = 100$

Choose a new letter to use instead of box – any letter is fine!

Rewrite the number sentence:

$94 + \square = 100$

Work out what your letter stands for.

Repeat for the following, choose a different letter for each one.

$\square \times 4 = 36$

$\square \times 4 = 36$

$80 - \square = 48$

$80 - \square = 48$

$\square \div 2 = 54$

$\square \div 2 = 54$

Investigation Algebra chain

$$\begin{array}{ll} a + 15 = 20 & a = \\ ab = 40 & b = \\ c \div b = 2 & c = \\ d - c = 24 & d = \\ de = 120 & e = \\ ae = 15 & \text{check!} \end{array}$$



- Work out what a represents in the first equation.
- a represents the same number in the second equation. So, use 5 instead of a to work out what b represents, i.e. $5 \times b = 40$.
- Now work out b , use this in the third equation, work out c , use this in the next equation and so on.
- The last equation is a check! If your answers for a and e don't multiply to make 15, you have made a mistake somewhere.

Challenge

Can you create a similar chain of equations?