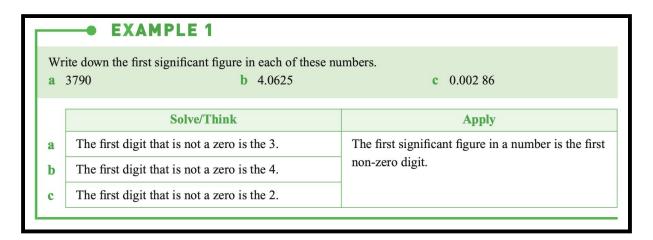
## WALT write numbers as significant figures

**Success Criteria I** know that all digits that not a zero are significant figures. The first significant figure in a number is the first digit that is not a zero( reading from left to right) Zeros at the end of a number may or may not be significant.



1 Write down the first significant figure in each of the following numbers.

a 2876

**b** 5 069 836

c 1.0035

**d** 0.0791

e 0.000 802

## Worked example

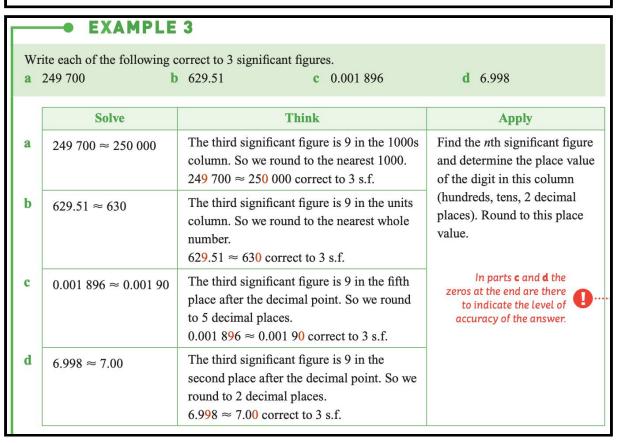
Ro		he following number of significant figures.  c 3 d 4	e 5
	Solve	Think	Apply
a	63.750 91 ≈ 60	The first significant figure is 6, which is in the tens column. So we round to the nearest 10. $63.750 \ 91 \approx 60$ correct to 1 significant figure.	If rounding to <i>n</i> significant figures, find the <i>n</i> th significant figure
b	63.750 91 ≈ 64	The second significant figure is 3, which is in the units column. So we round to the nearest 1 (whole number). $63.750 \ 91 \approx 64$ correct to 2 significant figures.	and determine the place value of the digits in this column (hundreds, tens, 2 decimal places). Round
c	63.750 91 ≈ 63.8	The third significant figure is 7, which is in the first place after the decimal point. So we round to 1 decimal place. $63.750 \ 91 \approx 63.8$ correct to 3 significant figures.	to this place value. The standard abbreviation for writing significant figures is s.f.
d	63.750 91 ≈ 63.75	The fourth significant figure is 5, which is in the second place after the decimal point. So we round to 2 decimal places. $63.750 \ 91 \approx 63.75$ correct to 4 significant figures.	
e	63.750 91 ≈ 63.751	The fifth significant figure is 0, which is in the third place after the decimal point. So we round to 3 decimal places. $63.750  91 \approx 63.751         $	

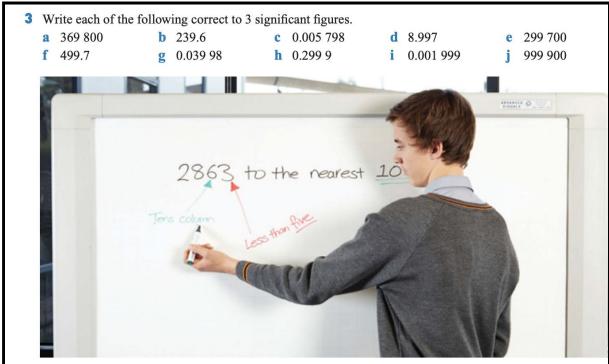
 2 Round each number below to:

 i 1 s.f.
 ii 2 s.f.
 iii 3 s.f.

 a 428.3
 b 6238
 c 7.819
 d 0.5273
 e 53 689

 f 725 600
 g 0.039 26
 h 0.005 072
 i 6103
 j 2005





## EXAMPLE 4

When a number was rounded to 2 significant figures, the answer was:

- **a** 430 **b** 3.7
  - i What is the smallest the number could have been?
  - ii What is the largest the number could have been?
  - iii Write a mathematical statement that shows the range of possible numbers.

	Solve	Think	Apply					
a i	425	The second significant figure is in the tens column, hence the number has been rounded to the nearest 10. Although 425 is halfway between 420 and 430, it is rounded up to 430. This is the smallest the number could have been.	Find the place value of the <i>n</i> th significant figure. This indicates how the number has been rounded (to the					
ii	<435	We cannot specify the largest number, but we know that it has to be less than 435, as 435 would be rounded up to 440.	nearest 100, 10,, 2 decimal places). Complete as for					
iii	425 ≤ number < 435	Example 7 in Section 4E.						
b i	3.65	The second significant figure is in the first column after the decimal point, hence the number has been rounded to 1 decimal place.  Although 3.65 is halfway between 3.6 and 3.7, it is rounded to 3.7. This is the smallest the number could have been.  We cannot specify the largest number, but we do know that it has to be less than 3.75, as 3.75 would be rounded up to 3.8.						
ii	<3.75							
iii	3.65 ≤ number < 3.75	The number could be equal to 3.65 or between 3.65 and 3.75.						

- 4 When a number was rounded to 2 significant figures the answer was:
  - **a** 560
- **b** 8.2
- c 48
- **d** 0.72
- e 37 000
- f 0.084

- i What is the smallest the number could have been?
- ii What is the largest the number could have been?
- iii Write a mathematical statement that shows the range of possible numbers.
- **5** When a number was rounded to 3 significant figures the answer was:
  - a 483
- **b** 3.86
- c 14 500
- **d** 0.128
- e 56.9
- **f** 3210
- Write a mathematical statement that shows the range of possible numbers in each case.
- **6** Write a mathematical statement that shows the range of possible numbers if each of the following numbers was rounded to the given number of significant figures.
  - a 2 s.f. the answer is 300

**b** 2 s.f. the answer is 3000

c 3 s.f. the answer is 6000

**d** 3 s.f. the answer is 24 000

**e** 3 s.f. the answer is 500 000

f 2 s.f. the answer is 0.80

te the number of 294	significant figures in each of the following numbers.  b 0.3 c 4.20 d 0.0017	e 56 000		
Solve	Think	Apply		
3	There are 3 digits in the number 294.	For decimal numbers,		
1	The first significant figure in 0.3 is the first non-zero digit. Hence the first zero is not significant.	zeros in front of the first non-zero digit are		
3	The zero on the end of this number indicates it has been rounded to 2 decimal places.  Hence the zero in 4.20 is significant.	not significant, zeros after the first non-zero digit are significant.  For integers (whole numbers), zeros on the end of the number may or may not be significant.		
2	The first significant figure in 0.0017 is the first non-zero digit. Hence the first three zeros are not significant.			
Cannot tell precisely.	The zeros on the end may or may not be significant. 56 300 rounded to the nearest $1000 \approx 56000$ . 55 970 rounded to the nearest $100 \approx 56000$ . 56 003 rounded to the nearest $10 \approx 56000$ . 55 999.6 rounded to the nearest whole number $\approx 56000$ . Hence there could be 2, 3, 4 or 5 significant figures.			

7 How many significant figures are there in each of the following numbers?

a	38	b	0.49	C	2896	d	0.075	e	0.40	f	1.800
g	0.0053	h	0.060	i	400	j	7000	k	23 000	1	8 000 000

## Check your answers

```
1 a 2 b 5 c 1 d 7 e 8
2 a i 400 ii 430
                              iii 428
  b i 6000
              ii 6200
                              iii 6240
               ii 7.8
                              iii 7.82
  c i 8
              ii 0.53
                              iii 0.527
  d i 0.5
              ii 54 000
  e i 50 000
                              iii 53 700
  f i 700 000 ii 730 000
                              iii 726 000
              ii 0.039
  g i 0.04
                              iii 0.0393
  h i 0.005
             ii 0.0051
                              iii 0.005 07
  i i 6000 ii 6100
                         iii 6100
  j i 2000 ii 2000
                         iii 2010
3 a 370 000 b 240 c 0.005 80 d 9.00
  e 300 000 f 500 g 0.0400 h 0.300
  i 0.002 00 j 1 000 000
4 a i 555
                       ii < 565
   iii 555 \le \text{number} < 565
                    ii < 8.25
  b i 8.15
  iii 8.15 \le \text{number} < 8.25
  c i 47.5 ii <48.5
  iii 47.5 \le \text{number} < 48.5
  d i 0.715 ii < 0.725
   iii 0.715 \le \text{number} < 0.725
  e i 36 500 ii <37 500
   iii 36\,500 \le \text{number} < 37\,500
  f i 0.0835 ii < 0.0845
   iii 0.0835 \le \text{number} < 0.0845
5 a 482.5 \le \text{number} < 483.5
  b 3.855 \le \text{number} < 3.865
```