

SMILE WORKCARDS

Ordering and Rounding

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Calculator Guesses

$$16 \times ? = 304$$

I GUESS IT MIGHT BE 15.....
I'LL USE THE CALCULATOR TO CHECK.
240..... IT'S TOO LOW.

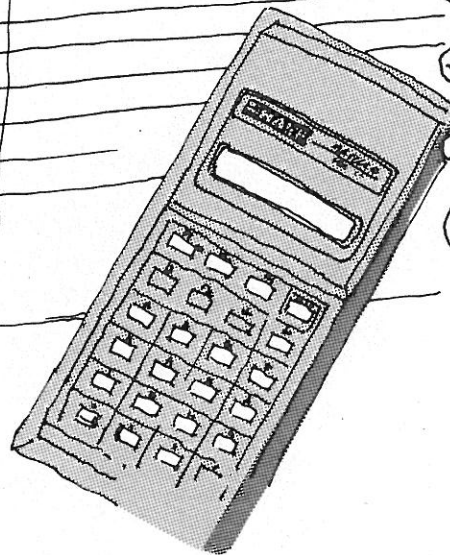
I'LL TRY 18..... TOO LOW AGAIN.

I'LL TRY 20.....
TOO HIGH THIS
TIME.....

BUT I'VE
NARROWED IT
DOWN.....

I'LL TRY 19.....
... GREAT,
IT'S RIGHT !!

(A) $16 \times ? = 304$		
GUESS	calculator	
15	240	
18	288	
20	320	
19	304	
(B) $137 \times ? = 685$		
GUESS	calculator	
3	411	



Try these:

- | | |
|-------------------------|--------------------------|
| 1. $137 \times ? = 685$ | 6. $? \times 46 = 966$ |
| 2. $? \times 21 = 147$ | 7. $4956 = 354 \times ?$ |
| 3. $19 \times ? = 247$ | 8. $? \times 214 = 2568$ |
| 4. $? \times 23 = 529$ | 9. $25 \times ? = 625$ |
| 5. $24 \times ? = 384$ | 10. $25 \times ? = 6250$ |

Rounding to 10

Smile 2371

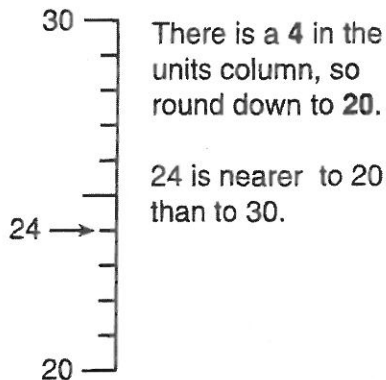
An activity for 2 - 4 people.

You will need Smile 2226 Sum Number Cards and 20 counters of the same colour for each player.

To round to the nearest 10.

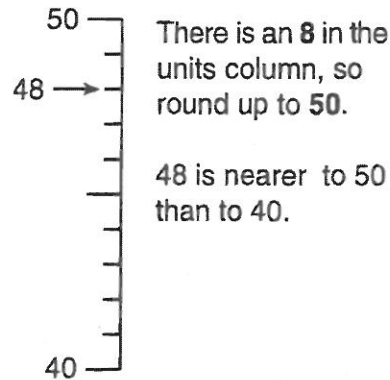
Look at the digit in the units column.

24



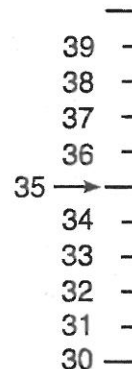
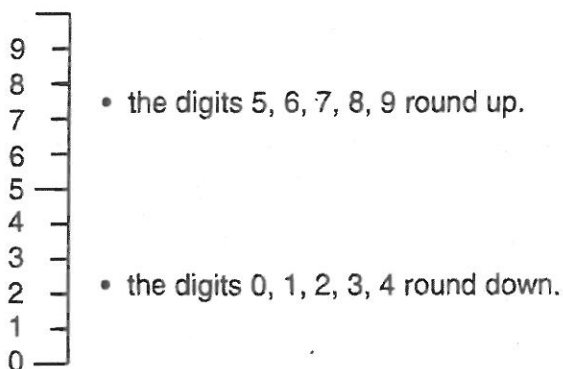
24 rounded to the nearest 10 is 20.

48



48 rounded to the nearest 10 is 50.

35



35 rounded to the nearest 10 is 40.

1. In your book write down these numbers to the nearest 10.

- a) 57 b) 33 c) 45 d) 9
e) 82 f) 55 g) 14 h) 98

2. Turn over to play the Rounding to 10 Game.

Rounding to 10 Game

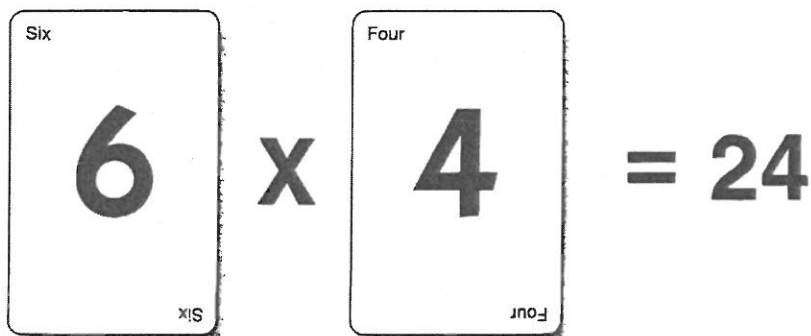
This is a game for 2 - 4 players.

Take out all the 3, 4, 5, 6, 7, 8 and 9 cards from Smile 2226 Sum Number Cards and 20 counters of the same colour for each player.

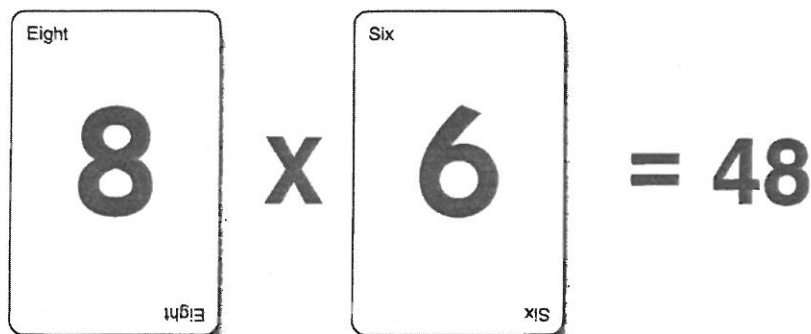
The Rules:

- Shuffle the cards.
- Place the cards face down.
- Take turns to turn over 2 cards.
- Multiply the two numbers together and round the answer to the nearest 10.
- Use a counter to cover up your rounded number on the board.
- The winner is the first player to get 3 in a line.
- Play the game several times.

Example:


$$\begin{array}{|c|} \hline \text{Six} \\ \hline 6 \\ \hline \text{Six} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Four} \\ \hline 4 \\ \hline \text{Four} \\ \hline \end{array} = 24$$

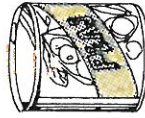
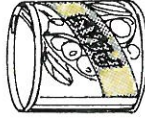
24 rounded to the nearest 10 is **20**.
The counter can cover any **20** on the board.


$$\begin{array}{|c|} \hline \text{Eight} \\ \hline 8 \\ \hline \text{Eight} \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Six} \\ \hline 6 \\ \hline \text{Six} \\ \hline \end{array} = 48$$

48 rounded to the nearest 10 is **50**.
The counter can cover any **50** on the board.

10	30	20	10	30	40	20
20	10	80	40	60	10	30
50	60	70	20	10	50	40
10	30	10	20	30	20	10
40	30	50	70	10	50	40
60	20	80	40	60	50	10
20	10	40	20	30	10	20

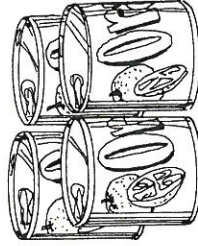
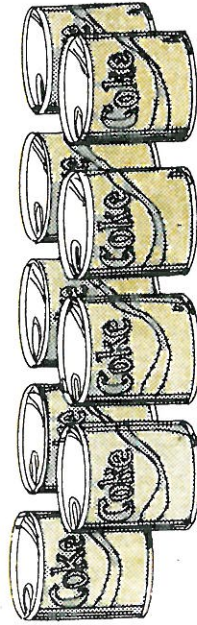
Less than— More than



5 tins are more than 3 tins.

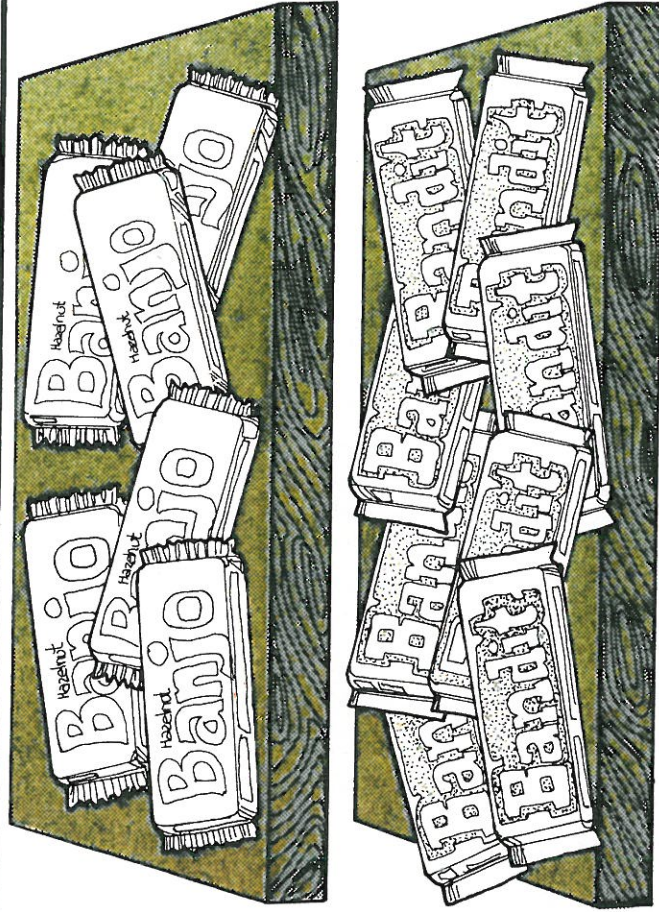
5 is 2 more than 3.

2 more than 3 is 5.



Copy and complete:

- (1) 9 is 5 more than 4.
- 5 more than 4 is .
- (2) 3 more than 2 is .
- (3) 4 more than is 7.
- (4) more than 5 is 10.
- (5) 7 more than 1 is .



6 chocolate biscuits are less than
8 chocolate biscuits.

6 is 2 less than 8.

2 less than 8 is 6.

Copy and complete:

- (6) 4 is 5 less than 9.
- 5 less than 9 is .
- (7) 3 less than 7 is .
- (8) 4 less than is 4.
- (9) less than 10 is 7.
- (10) 6 less than 9 is .

2 games

Two Down

This envelope contains:
1 playing board
A set of 32 number cards.

for 2 players.

- Share the cards equally.
- Take turns to put down 2 cards at a time on the board.
- Cover *any* 2 numbers so that the sentence stays true.

Smile 2172a

Two Down

Game 1 - More Than

7 is 2 more 5

Turn over for Game 2

- Leave the cards on the board and continue playing.
- The first person to finish all their cards wins.
- For **each** game write down the final winning sentence.

Two Down

Smile 2172a

Game 1 - More Than

7

is

3

more than

4

Turn over for Game 2

Game 2 - Less Than

2

is

5

less than

7

Turn over for Game 1

Two Down

These cards and those from Smile **2172c** should be cut out and kept with the playing board Smile **2172a** in the envelope Smile **2172**.

**1****1****2****2****1****1****3****3****5****5****7****7****6****6****3****3**

Two Down

Smile 2172c

These cards and those from Smile **2172b** should be cut out and kept with the playing board Smile **2172a** in the envelope Smile **2172**.



7

7

8

8

8

8

9

9

9

9

2

2

1

4

4

3

Sensible Answers

Do not use a calculator.

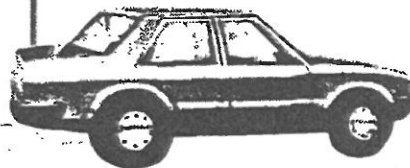


Problem:

18 people are going to Southwold by car.
Four people can fit in each car.

How many cars are needed?

SOUTHWOLD



Method:

$$18 \div 4 = 4.5$$

The answer to 18 divided by 4 is between 4 and 5.
If you gave the answer 4 only 16 people could go.
2 people would be left behind.

So the sensible answer is 5 cars.

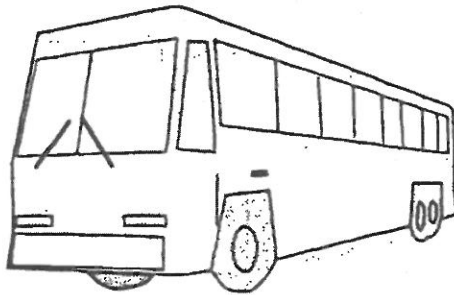
The sensible answer depends upon the original problem.

Solve the problems below.

For each problem, show your method and make sure that your answer is sensible.

1. 169 students are going on a school trip to Margate.
Each coach can carry 50 students.

How many coaches will be needed?



2. A football club has 49 members. A football team needs 11 players.

How many teams can the football club field?



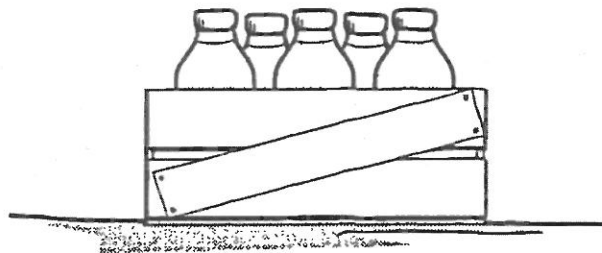
3. A tin of paint covers 25 square metres.

How many tins of paint will you need to cover
116 square metres?



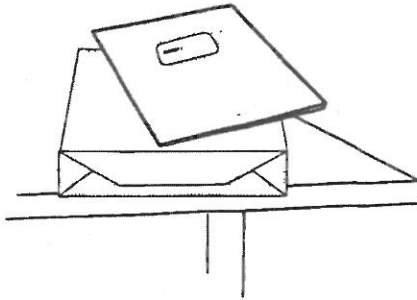
4. Milk is sold in crates of 12 identical bottles.
A wholesaler has 102 identical bottles.

How many crates can she make up?



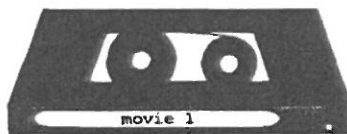
5. Exercise books are sold in packets of 10. Ms Kershaw wants to order exercise books for 67 students.

How many packets of books does Ms Kershaw need to order?

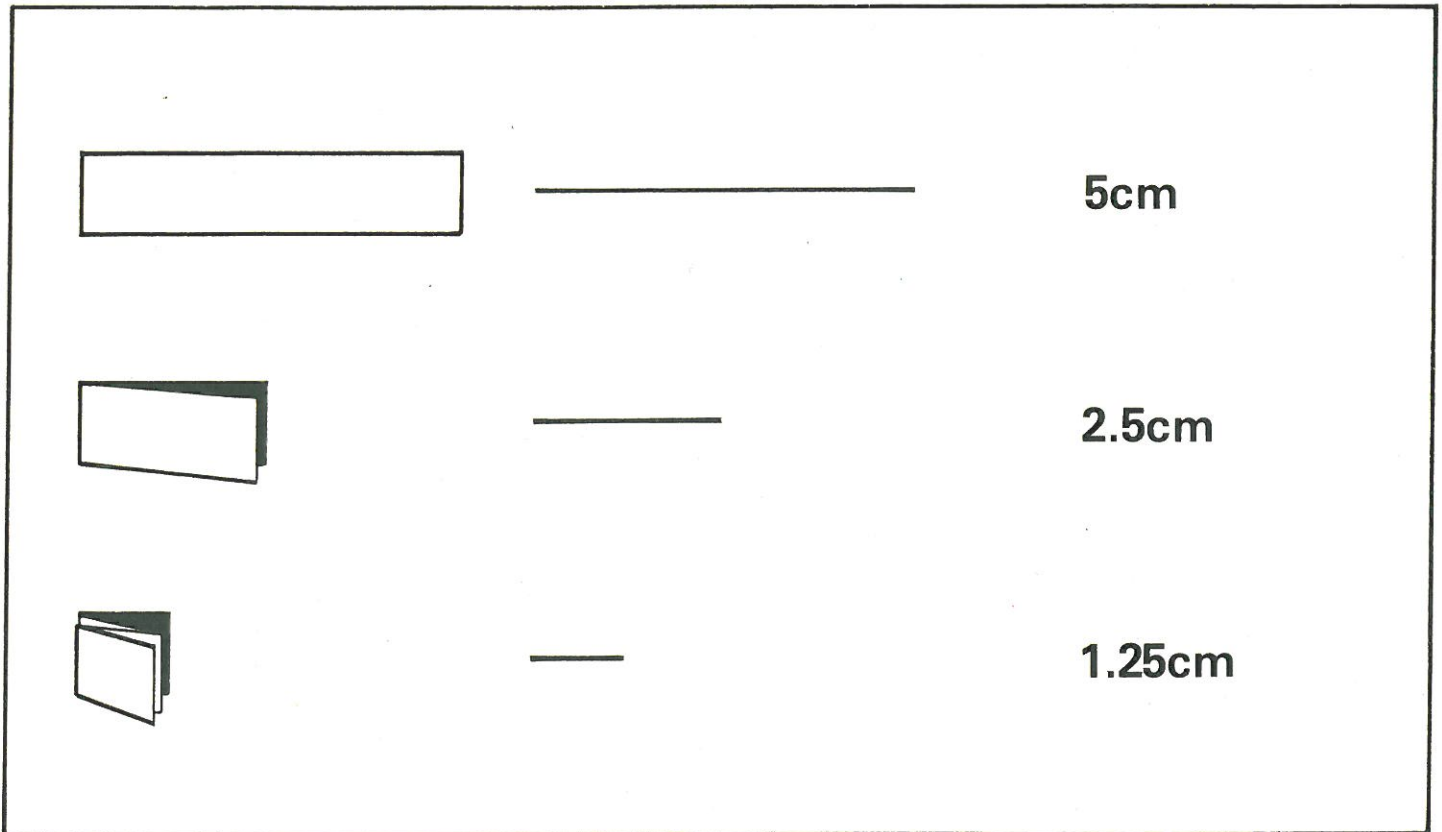


6. Jameela wants to record her favourite television programme.
Each episode lasts 40 minutes.

How many episodes can she record on a 3 hour tape.



Halving






1) Use a calculator to continue the sequence:

original line 5
 halved 2.5
 halved again 1.25
 etc.

Use your results to decide which is larger

- (a) 5 or 2.5
- (b) 2.5 or 0.625
- (c) 0.03906 or 0.3125
- (d) 0.3125 or 0.625

2) Start with 4 and record the results:

original number 4 
 halved 2 
 halved again 
 etc.

Which is larger?

- (a) 0.5 or 0.25
- (b) 0.0625 or 0.125
- (c) 1 or 0.5
- (d) 0.25 or 0.125

3) Start with 20 and make it 10 times smaller each time:

Record the results 20

2

''

''

''

(Did you need to use a calculator this time?)

Which is larger? (a) 2 or 0.2
(b) 0.2 or 0.02
(c) 0.002 or 0.0002

4) Which is larger? (a) 0.75 or 0.375
(b) 0.1875 or 0.09375
(c) 0.375 or 1.5
(d) 0.09375 or 0.75

If you are not sure, start with 3 and keep halving.

Higher decimal win

Smile 2365

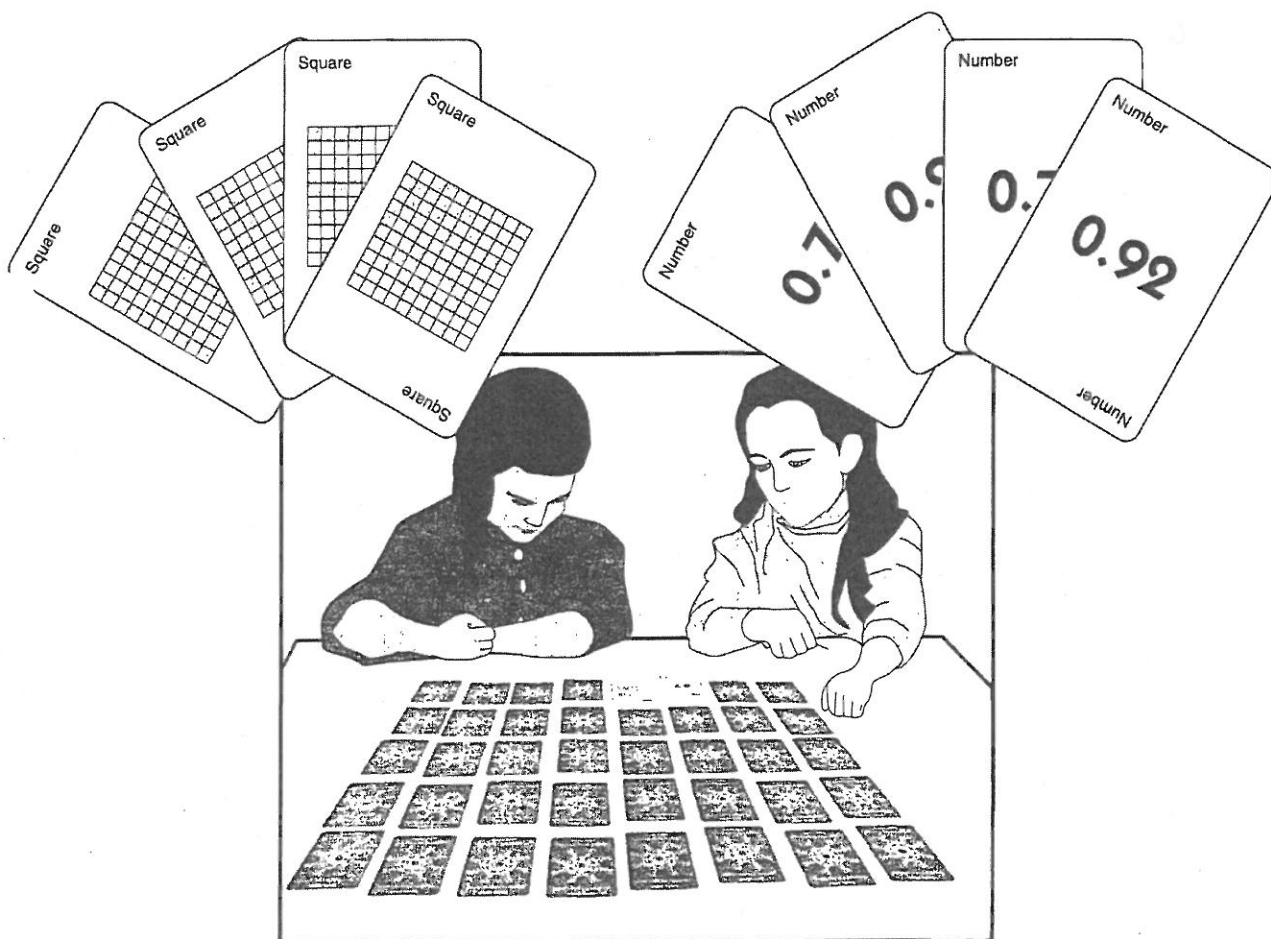
A game for 2 players.

You will need the SMILE Decimal Playing Cards.

Take out the 13 cards with 'Squares' and the 13 cards with 'Numbers'.

Shuffle the cards.

Deal the cards, face down, in front of you.



Each player turns over one card.

The player with the higher decimal wins that round and keeps both cards.

Carry on until you have used all the cards.

The player with the most cards wins.

Variation

Try turning over 2 cards at a time, adding the two numbers together. The player with the higher decimal wins.

Approximate Solutions



What is 36 multiplied by 22?
Give me a rough answer, working it out in your head.

36 x 22?
Can't do that in my head ...
... 40 x 22?
even that's a bit hard ...

About 800

1. What is 46×17 ?
Give a rough answer, using the same method.
What calculation did you use?

2. Copy and complete this table:

calculations	rough calculations	rough answers
$583 \div 18$	$600 \div 20$	30
408×68		
$875 \div 23$		
79×22		
$576 \div 27$		
67×81		

rough
 $400 \times 600 \div 30$
 80×20 $70 \times \underline{600 \div 20}$
 $900 \div 20$

rough
 28000 20
 ~~30~~ 5600
 160 45

3. Choose your own rough calculations to complete this table:

calculations	rough calculations (approximations)	rough answers (approximate solutions)
71×88		
$383 \div 53$		
49×48		

4. Here is a problem ...

... and some calculations.

There are 1170 pupils in the school.
There are 42 tutor rooms.
Work out approximately, how many pupils are in each tutor group.

1170×42 $1170 \div 42$
 $1200 \div$ 1200×40
 $1100 \div$

- Which two calculations must be wrong?
- Which two calculations give **approximate solutions** to the problem?
- Which calculation would you use?

5. Copy and complete this table in your book.

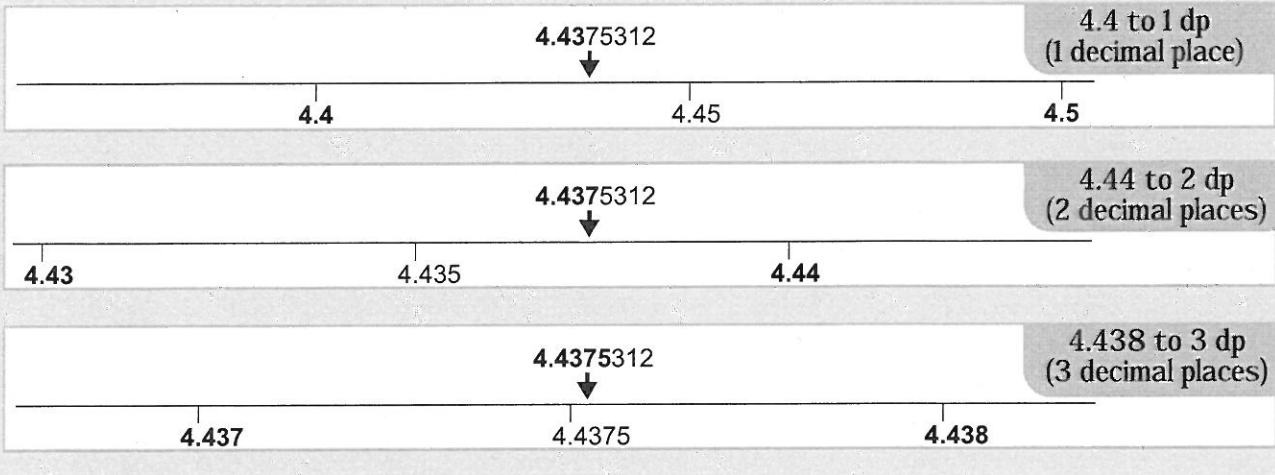
	problems	calculations	approximations	approximate solutions
a)	There are 36 eggs in a tray. A box of eggs contains 12 trays of eggs. About how many eggs are in a box?			
b)	About how many 62 seater coaches are needed to take a school of 1796 students on a trip?			
c)	A bottle of cola contains 1950ml. About how many millilitres in 11 bottles?			
d)	A bottle of cola contains 1950ml. 205ml are needed to fill a cup. About how many cups can be filled?			

- A job pays £214 per week.
About how much is this in one year (52 weeks)?
- Each student needs 27 centicubes to build a larger cube.
There are 29 students in the class.
About how many centicubes are needed?
- One pint of milk is sufficient for 22 cups of tea.
About how many pints are needed for 485 cups of tea?

Decimal Places Match

The number on the calculator shows
This can be approximated to:

4.4375312

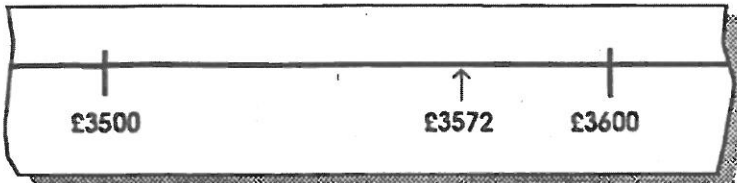


Match each calculator answer to its three approximations.

Number on calculator 3.4457982	Number to 2 decimal places 3.45 to 2 dp	Number to 1 decimal place 3.6 to 1 dp	Number to 3 decimal places 3.456 to 3 dp
Number to 1 decimal place 3.5 to 1 dp	Number to 3 decimal places 3.557 to 3 dp	Number on calculator 3.5471035	Number to 2 decimal places 3.47 to 2 dp
Number to 2 decimal places 3.46 to 2 dp	Number on calculator 3.4561207	Number to 3 decimal places 3.547 to 3 dp	Number to 1 decimal place 3.4 to 1 dp
Number to 1 decimal place 3.5 to 1 dp	Number to 3 decimal places 3.446 to 3 dp	Number on calculator 3.5568156	Number to 2 decimal places 3.56 to 2 dp
Number to 1 decimal place 3.5 to 1 dp	Number to 3 decimal places 3.467 to 3 dp	Number to 2 decimal places 3.55 to 2 dp	Number on calculator 3.4672331

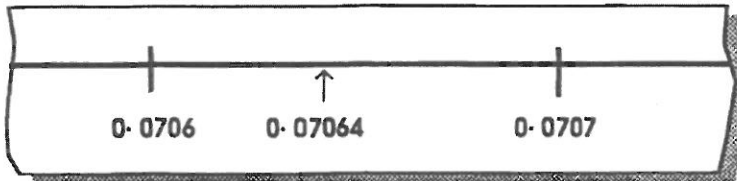
Significant Figures

Smile 1202



£3572 is closer to £3600 than £3500

so £3572 = £3600 (to 2 significant figures).



0.07064 is between 0.0706 and 0.0707 and is closer to 0.0706.

0.07064 = 0.0706 (to 3 sig. fig.)

Note The first significant figure is the first non-zero digit. After the first significant figure, all figures are significant figures.

A The following answers were found using a calculator.
Write each of the answers (a) correct to 2 significant figures
(b) correct to 3 significant figures.

Putting your answers in a table like this may help.

		(a) 2 significant figures	(b) 3 significant figures
1.	49.7327 cm ²	50 cm ²	49.7 cm ²

- | | | |
|----------------------------|----------------------------|---------------------------|
| 1. 49.7327 cm ² | 6. 8.937 kg | 11. 40.96 kg |
| 2. £283 721 | 7. 10.785 m | 12. 20.81 litres |
| 3. 7.8241 cm | 8. £37 694 | 13. 0.9008 km |
| 4. 0.06736 m | 9. 40.038 cm ³ | 14. 5.942 m |
| 5. 0.0004842 | 10. 0.70683 m ² | 15. 10.94 cm ² |

B Some fractions and their equivalent decimal values are given below.

Write each decimal correct to 3 significant figures.

- | | |
|---------------------------------|--|
| 1. $\frac{2}{3} = 0.\dot{6}$ | 6. $\frac{5}{7} = 0.\dot{7}1428\dot{5}$ |
| 2. $\frac{5}{6} = 0.8\dot{3}$ | 7. $\frac{11}{12} = 0.91\dot{6}$ |
| 3. $\frac{5}{11} = 0.4\dot{5}$ | 8. $\frac{7}{13} = 0.\dot{5}3846\dot{1}$ |
| 4. $\frac{7}{80} = 0.0875$ | 9. $\frac{5}{13} = 0.\dot{3}8461\dot{5}$ |
| 5. $\frac{5}{12} = 0.41\dot{6}$ | 10. $\frac{1}{7} = 0.\dot{1}4285\dot{7}$ |

Note The dot above a figure shows that the figure recurs. e.g.

$$0.\dot{8}\dot{3} = 0.8333\dots$$

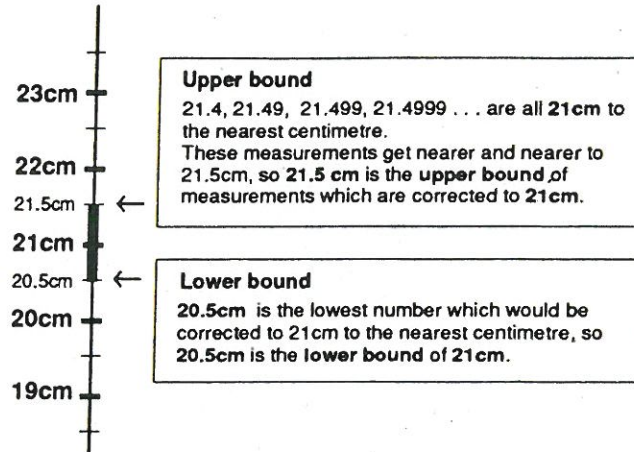
Two dots show that the figures between the dots recur. e.g.

$$0.\dot{8}\dot{3}\dot{5} = 0.835835835\dots$$

Range of Area

The side of this square card is **21cm** to the **nearest centimetre**.

This means that the side length could be anywhere between **20.5cm** and **21.5cm**.



The **area of the square** could range from:

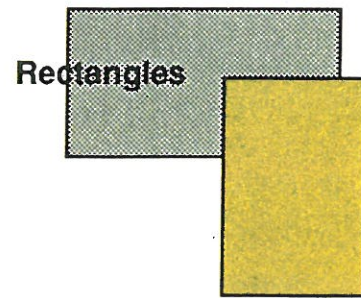
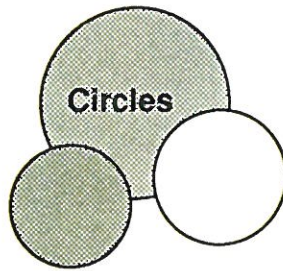
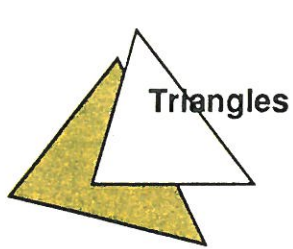
$$\begin{aligned} \text{Largest possible area} &= (21.5 \times 21.5) & \text{to} & \text{Smallest possible area} &= (20.5 \times 20.5) \\ &= 462.25\text{cm}^2 & & &= 420.25\text{cm}^2 \end{aligned}$$

So the **range of area** for this square is **42cm^2** ($462.25\text{cm}^2 - 420.25\text{cm}^2$).

1. a) Find the range of area for a square of side **16cm** to the nearest centimetre.
- b) Can you find a connection between the length of the side of this square (*to the nearest centimetre*) and the range of area?
- c) Prove your result for any square.

Turn over.

- 2.** a) Investigate **one** of these shapes.



- b) Find and prove rules for your chosen shape.

- 3.** a) Find rules for shapes measured to the nearest $\frac{1}{2}$ cm.

- b) Find rules for shapes measured to the nearest x cm.

You might like to look at solids.