



### Looking for Patterns

One way of finding out whether a larger number is divisible by 11 is to add together the two sets of alternate digits.

If both totals are equal or have a difference that is a multiple of 11, then the number is divisible by 11.

For example,

$$\begin{array}{r}
 7172 \\
 7 + 7 = 14 \\
 1 + 2 = 3 \\
 14 - 3 = 11
 \end{array}
 \qquad
 \begin{array}{r}
 10417 \\
 1 + 4 + 7 = 12 \\
 0 + 1 = 1 \\
 12 - 1 = 11
 \end{array}
 \qquad
 \begin{array}{r}
 536932 \\
 5 + 6 + 3 = 14 \\
 3 + 9 + 2 = 14
 \end{array}$$

Use each of the digits below only once to complete the six numbers so that each number is divisible by 11.

$$\begin{array}{l}
 (6)(0)(5)(1)(4)(7)(8)(9)(2)(7)(1)(0)(2)(0) \\
 \bigcirc 45 \bigcirc \quad 6 \bigcirc \bigcirc 27 \quad 497 \bigcirc \bigcirc 2 \\
 52 \bigcirc \bigcirc 08 \quad 3577 \bigcirc \bigcirc \quad 6 \bigcirc \bigcirc 838 \bigcirc \bigcirc
 \end{array}$$



### The Puzzler

For each of these division calculations write a one-digit, two-digit or three-digit number.

Each of the numbers is a prime number, a square number or a triangular number.

$$\begin{array}{l}
 \bigcirc \bigcirc \bigcirc \bigcirc \div \bigcirc \bigcirc \bigcirc = \bigcirc \bigcirc \\
 \bigcirc \bigcirc \bigcirc \bigcirc \div \bigcirc \bigcirc \bigcirc = \bigcirc \bigcirc \bigcirc \\
 \bigcirc \bigcirc \bigcirc \bigcirc \div \bigcirc \bigcirc \bigcirc = \bigcirc \bigcirc \bigcirc
 \end{array}$$

Name: \_\_\_\_\_

# The Maths Herald



Volume 5

Date: \_\_\_\_\_



### Money Matters



Michael has a pile of £1 coins.

When he counted the coins into piles of £4, he had £2 left over. When he counted them into piles of £5 he had £1 left over.

How much money might Michael have?

Write some other situations similar to this.



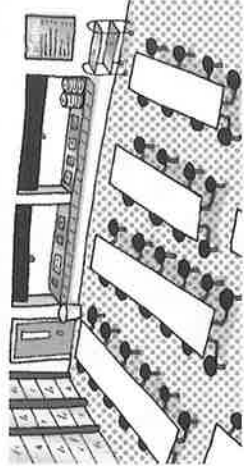
### What's the Problem?

There are a total of 440 children eating in the dinner hall today. Mrs Beeton, the school cook, has tables that seat 8 children or 12 children. She knows that with that number of children, she is able to put out just enough tables so that there are no empty seats.

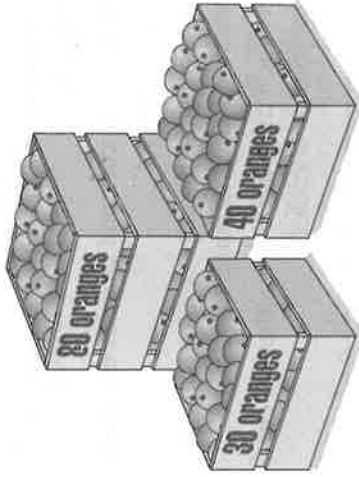
How many tables of each size does Mrs Beeton put out?

Is there more than one possibility?

What patterns do you notice?



### What's the Problem?



A school is organising a fun run. They have decided that at the end of the run they will give each child an orange.

They have calculated that they will need a total of 360 oranges.

Oranges come in boxes of 30, 40 or 80. What are the different combinations of boxes that the school could buy?



### The Puzzler

Rearrange each set of four digits (and the decimal point) to make a division calculation that equals the number in the box.

#### Example

$$\begin{array}{r} 2 \ 2 \ 3 \ 5 \\ 8 \cdot 4 \\ \hline 25 \cdot 2 \div 3 \\ 25 \cdot 2 \times 10 = 252 \\ 252 \div 3 = 84 \\ 84 \div 10 = 8 \cdot 4 \end{array}$$

$$\begin{array}{r} 6 \ 4 \ 3 \ 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \ 9 \ 3 \ 7 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \ 4 \ 8 \ 6 \\ \hline \end{array}$$



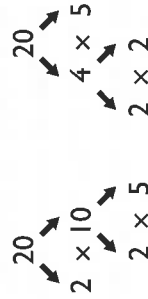
### What's the Problem?

In a large family garage there are a total of 22 wheels.  
All the wheels are either on cars or bicycles.  
How many cars and bicycles are there in the garage?  
How many different combinations of cars and bicycles could there be?  
What if the wheels are either on cars, bicycles or tricycles?



### Let's Investigate

Draw two different factor trees for the number 12.  
Investigate and compare different factor trees for multiples of 12 from 12 to 72.  
These are two factor trees for 20.



### Looking for Patterns

$$\square^2 \div 3 = \bigcirc R 2$$

Can you find a square number that, when divided by 3, has a remainder of 2?  
Can you predict what remainder you will get when you divide  $16^2$  by 3?



### Let's Investigate

2, 3, 4, 7, 8

Investigate arranging the digits above to complete this division:

$$\begin{array}{r} \square \square \square \\ \square \square \square \cdot \square \square \square \\ \hline \square \square \square \end{array} =$$

What is the largest possible answer?  
What is the smallest possible answer?  
Now investigate this division.

$$\begin{array}{r} \square \square \square \\ \square \square \square \cdot \square \square \square \\ \hline \square \square \square \end{array} =$$



### Looking for Patterns

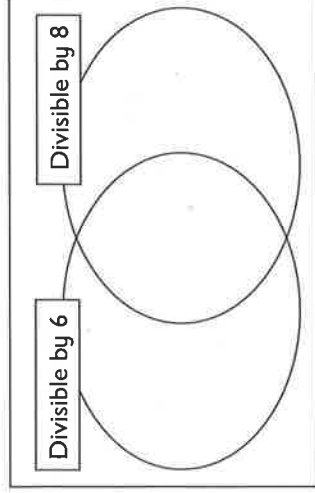
Fill in the missing digits so that each vertical and horizontal number is divisible by 9.  
Write about what you did.

3			2		4
		2			
			3		8
		7		4	
				6	
			1		4
		5			



### Let's Investigate

Investigate numbers from 1000 to 1200 that are divisible by 6, by 8 and by both 6 and 8.  
Show your results on a Venn diagram.  
What if the numbers are from 2000 to 2200?



### The Language of Maths

Design a poster to show the meaning of these words:

divisor      dividend      remainder  
quotient

