

Name ..... Class ..... Date .....

- 1 A three-digit number is multiplied by a two-digit number.  
How many digits could your answer have? Explain.
- 2 Peter says that half a number is always less than the number itself.  
Is he correct? Explain your answer.
- 3 A teacher said to a student:

‘To the nearest per cent,  $\frac{1}{7}$  is 14%’

The student said:

‘So, to the nearest per cent,  $\frac{2}{7}$  must be 28%’

Show that the student is wrong.

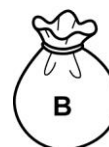
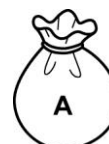
- 4 I have two bags of counters.  
Bag A contains 8 red counters and 12 yellow counters.

Bag B contains 7 red counters and 9 yellow counters.

I am going to take a counter at random from either Bag A or Bag B.

Which bag will give the higher probability of choosing a red counter?

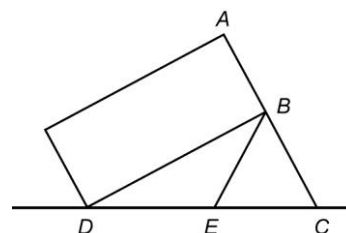
Explain your answer.



- 5 The diagram shows a rectangle just touching an equilateral triangle  $BCE$  so that  $ABC$  is a straight line.

What kind of a triangle is  $BED$ ?

Explain your answer fully.



- 6 Madhav wanted to calculate  $(14 \times 3)^2$   
He pressed these buttons on his calculator:



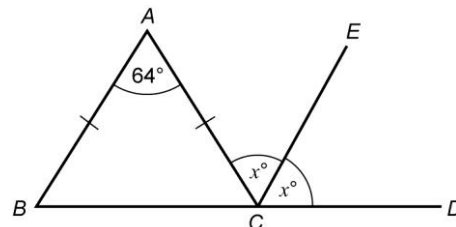
He got the answer 126, which is not correct.

- a Explain what is wrong with Madhav's method.
  - b What is the correct answer?
- 7 a Look at this equation:  
 $p + 2 = q - 3$   
Which of  $p$  and  $q$  is greater and by how much?
  - b Look at this equation:  
 $5 - c = 3 - d$   
Which of  $c$  and  $d$  is greater and by how much?

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- 8** A kilogram of salmon costs £6.25.  
Niki buys 4.2 kg of salmon for a party.  
She is told it will cost £23.75.  
Explain how you can easily see that this is not correct.

- 9** In the diagram,  $BCD$  is a straight line.  
Angles  $ACE$  and  $ECD$  are equal.  
By finding the value of  $x$ , show that  $AB$  and  $CE$  are not parallel.



- 10** Explain why a number which ends in '3' cannot be a multiple of 4.
- 11** The ratio of boys to girls in Josh's drama club is 1 : 3.  
Josh says this means that one-third of the drama club members are boys.  
Is he correct?

Explain your answer.

- 12** Geoff calculated that the mean age of the members of his badminton club was 16 years 8 months, and the range of their ages was 2 years 1 month.  
A new member, aged 14 years 10 months, joins the club.

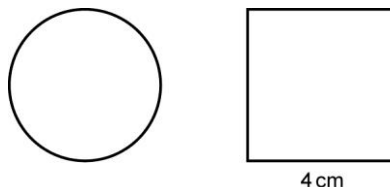
- a** Will the mean age of the members increase, decrease, stay the same, or is it impossible for you to tell?

Explain your answer.

- b** Will the range of ages increase, decrease, stay the same, or is it impossible for you to tell?

Explain your answer.

- 13** The circumference of the circle and the perimeter of the square are equal.  
Calculate the radius of the circle.  
Show your method.



- 14** Show that  $3^2 + 2^3 = (3^2)^2 - 4^3$

- 15** Look at these expressions

$$6y - 4$$

First  
expression

$$2y + 3$$

Second  
expression

What value of  $y$  makes the first expression **twice** as great as the second expression?  
Show your working.

- 16** Holly wrote the following:

$$\frac{1}{p} + \frac{1}{q} = \frac{1}{p+q}$$

Show that Holly's statement is not correct.