Section 1: Solving problems

Section test

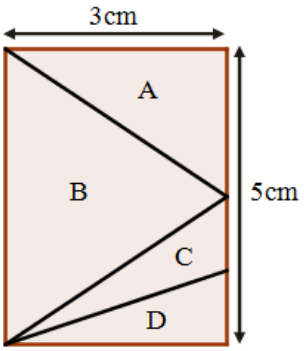
1. Multiplying a number by 2 is the same as adding 12 to the number. If x is the number, which of the equations below does x satisfy?

   (a) $x + 2 = 12x$
   (b) $2x = x + 12$
   (c) $\frac{x}{2} = x + 12$
   (d) $2x + 12 = x$

2. The cost of hiring a bike is £6 for the first hour and £4 for each hour after that. Which of the following formulae give the cost of hire C in pounds, in terms of the number of hours hired, h?

   (a) $C = 6 + 4h$
   (b) $C = 10h$
   (c) $C = 6 + 4(h - 1)$
   (d) $C = 6 + 4(h + 1)$

3. In the diagram the letters A, B, C, D represent the area in cm^2 of each shape. Which of the following equations is true? Choose as many as appropriate.



   (i) $C + D = 15 - A - B$
   (ii) $A + B = 15 - C + D$
   (iii) $A + C + D = B$
   (iv) $C + D = A$

4. You have two lists of numbers, list A and list B.
   List A contains 6 numbers and the average is 4.
   List B contains 4 numbers and the average is 5.
   What is the average of all the numbers in list A and list B?

5. Tony has a number of tokens to use at the fair. He gives a third of them to Nada. She uses 4 of them and then has 3 left.
   If T is the number of tokens that Tony had at the start, which of the equations below does T satisfy?

   (a) $\frac{T-4}{3} = 3$
   (b) $\frac{T}{3} - 4 = 3$
   (c) $\frac{T-3}{4} = 3$
   (d) $\frac{T}{4} - 3 = 4$

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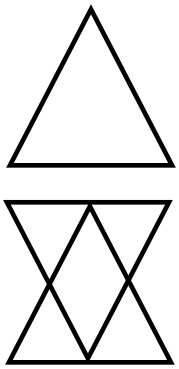
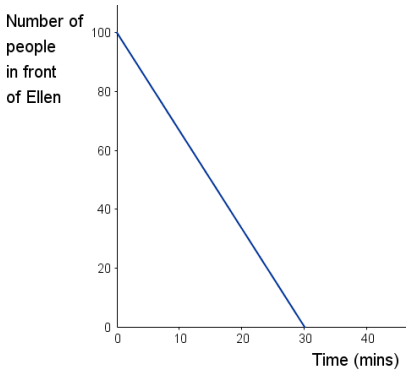
6. The perimeter of this equilateral triangle is 18 cm.



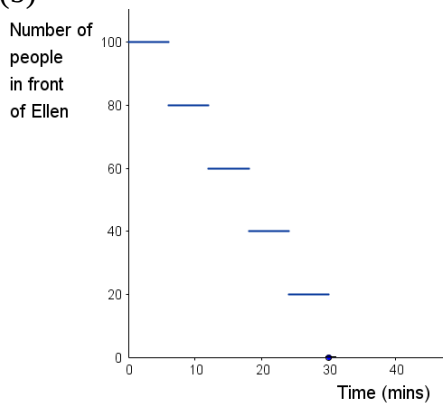
This shape is made up of two such triangles, overlaid symmetrically. What is its perimeter?

7. Ellen arrives to cross the river (at time 0 mins) just as the first ferry is leaving. It is an unusually busy day and she joins a queue as the 101st person. The ferry runs regularly until Ellen reaches the front of the queue 30 mins later. Which of the graphs below is likely to be the most accurate representation of the number of people in front of her at any time?

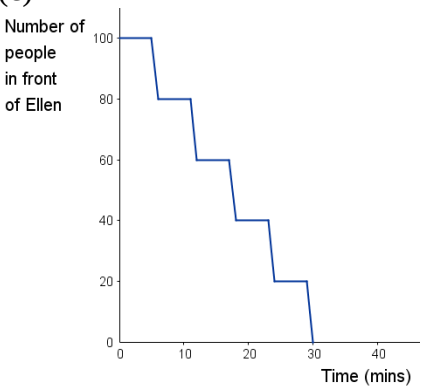
(a)



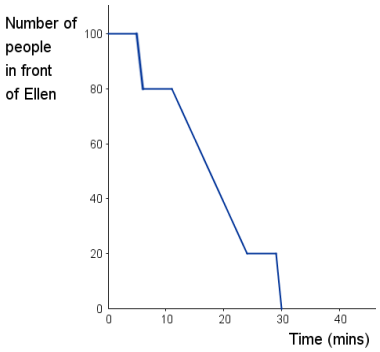
(b)



(c)



(d)



8. Marcus thinks of a number between 5 and 10. He multiplies the number by 4 and adds 20. He takes this answer, multiplies it by 4 and adds 20. He repeats this process a number of times and gets 868. What number did he begin with?

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9. A list of n numbers has average m. The number 6 is added to this list. In terms of n and m what is the average of the new list?

(a) $\dfrac{m+6}{n}$

(b) $\dfrac{m+6}{n+1}$

(c) $\dfrac{mn}{n+1}$

(d) $\dfrac{mn+6}{n+1}$

10. The diagram below shows a number line. The lengths of the red lines double in length from left to right below. What is the value of x?