

### EXERCISE: PROBLEMS

- (1) I have 35 coins with a total value of £1.  
It is a mixture of 2p and 5p coins.

How many of each type of coin do I have?

- (2) A fluid's volume,  $V$  litres, depends on its temperature  $T$  °C, according to the formula  $V = aT + b$  where  $a$  and  $b$  are constants.

If the volume is 19 litres at 8°C and 25 litres at 10°C, find the values of  $a$  and  $b$ .

- (4) Solutions of a salt come in two concentrations:  
STRONG contains 20 grams of salt per litre,  
WEAK contains 5 grams of salt per litre, of solution.

These solutions can be mixed to make solutions of salt of different concentrations.

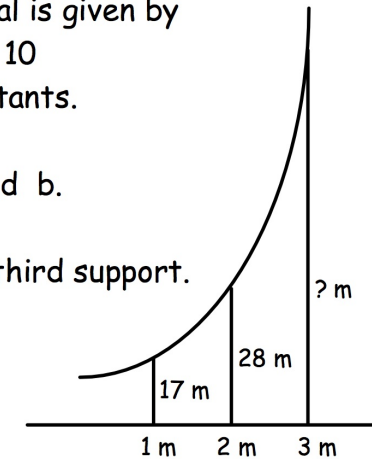
What volumes of the STRONG and WEAK solutions should be mixed together to make 10 litres of a solution with a concentration of 11 grams per litre?

- (3) Ski jump supports are positioned at 1 metre intervals. The height of a support,  $h$  metres, at the  $n$ th metre interval is given by

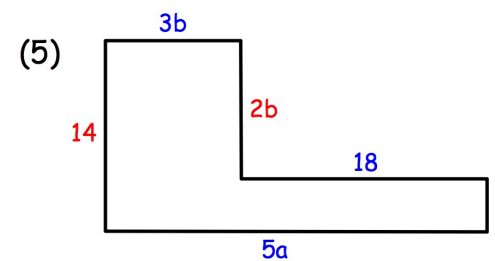
$$h = an^2 + bn + 10$$

where  $a$  and  $b$  are constants.

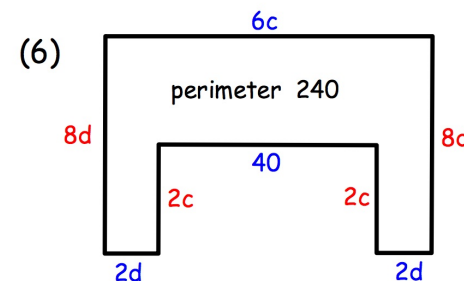
- (a) Find the values of  $a$  and  $b$ .  
(b) Find the height of the third support.



The shapes are formed from rectangles.

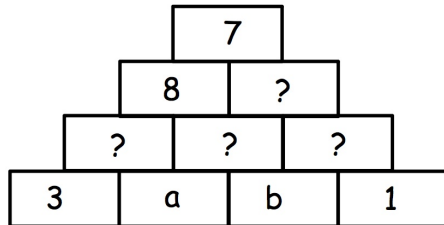
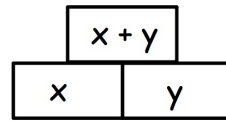


Find  $a$  and  $b$ .



Find  $c$  and  $d$ .

(7) The next brick in the tower is obtained by adding the two bricks below.



Find a and b.

(8) The next term in the sequence is obtained by adding the previous two terms.

For example:  $-2, 5, 3, 8, 11, 19 \dots$

Such a sequence is

$a, b, ?, ?, 13, ?, ?, 55 \dots$

Find a and b.

(9) Find **algebraically** the point of intersection of the two lines.

