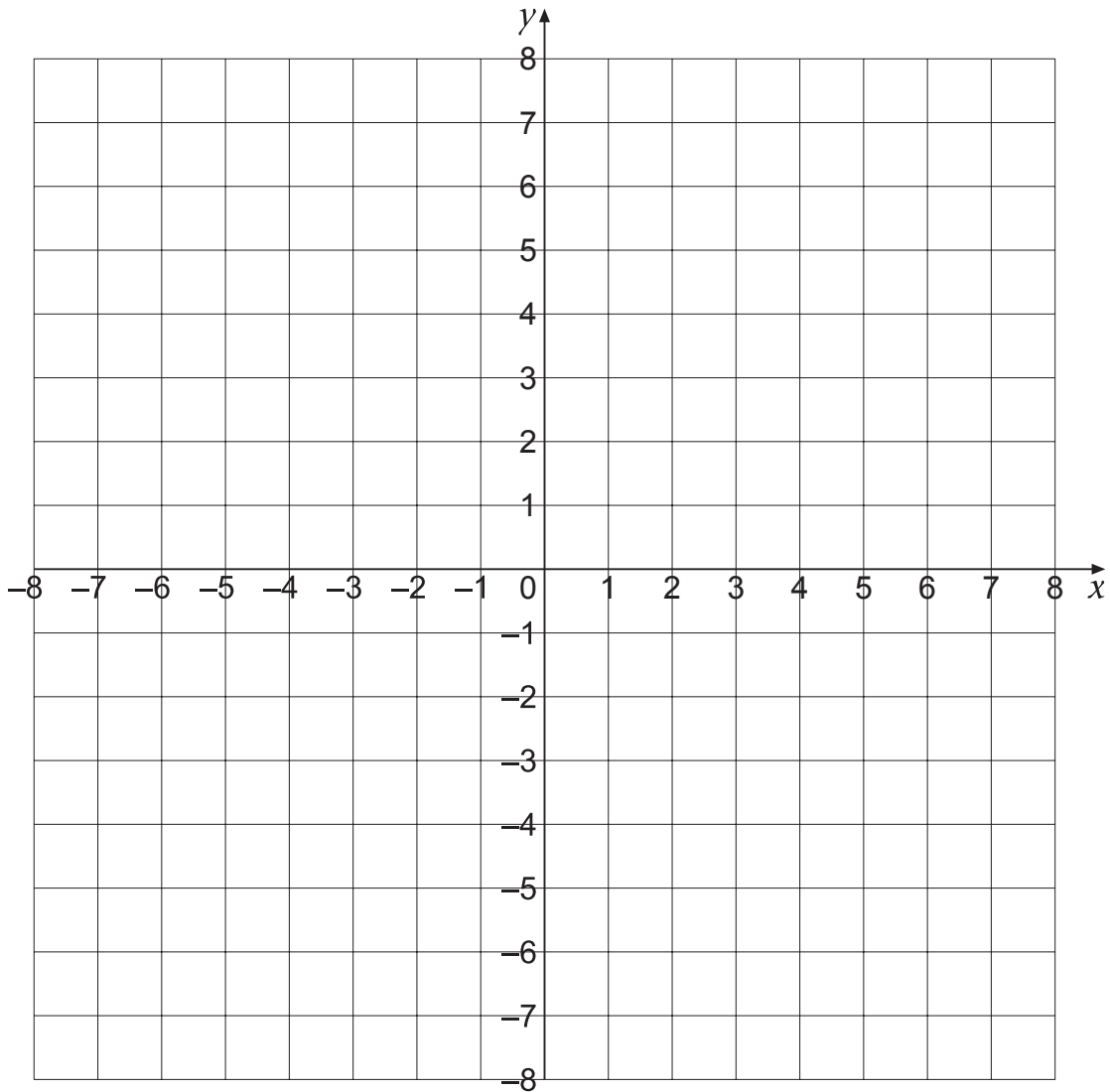
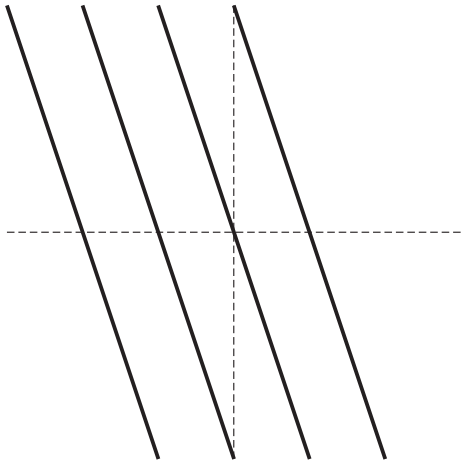

| | | | |
|-----------|-----------|-----------|-----------|
| 10^3 | 10^5 | 10^{-4} | 10^{-2} |
| 10^8 | 10^{-7} | 10^7 | 10^{-6} |
| 10^{-3} | 10^6 | 10^{-8} | 10^4 |
| 10^2 | 10^{10} | 10^9 | 10^{-5} |

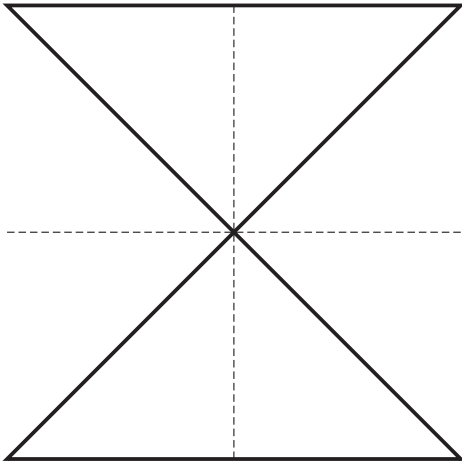


Suggest possible equations for the lines for each graph.
 (There is more than one answer in each case.)

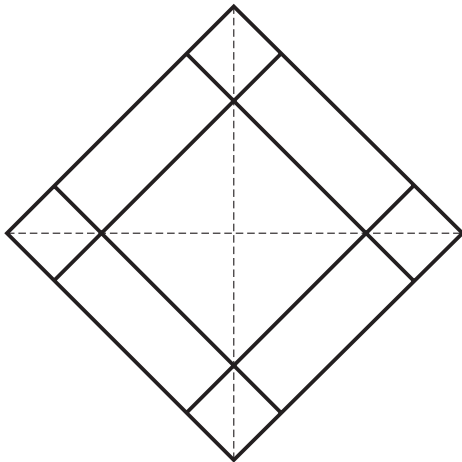
a.



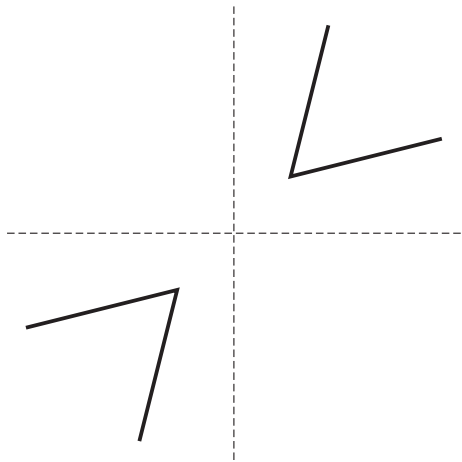
b.



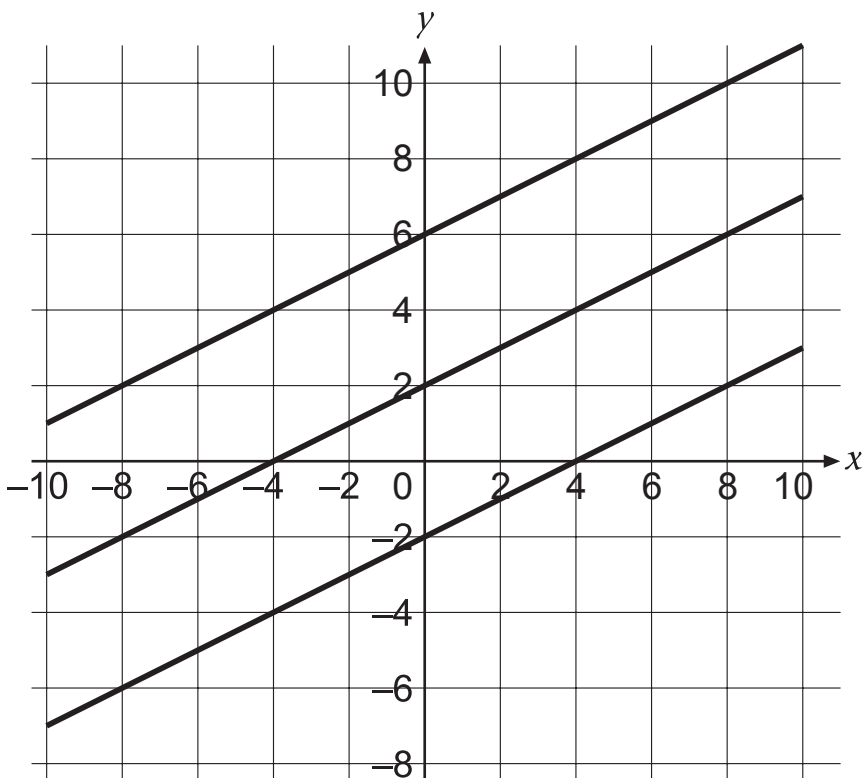
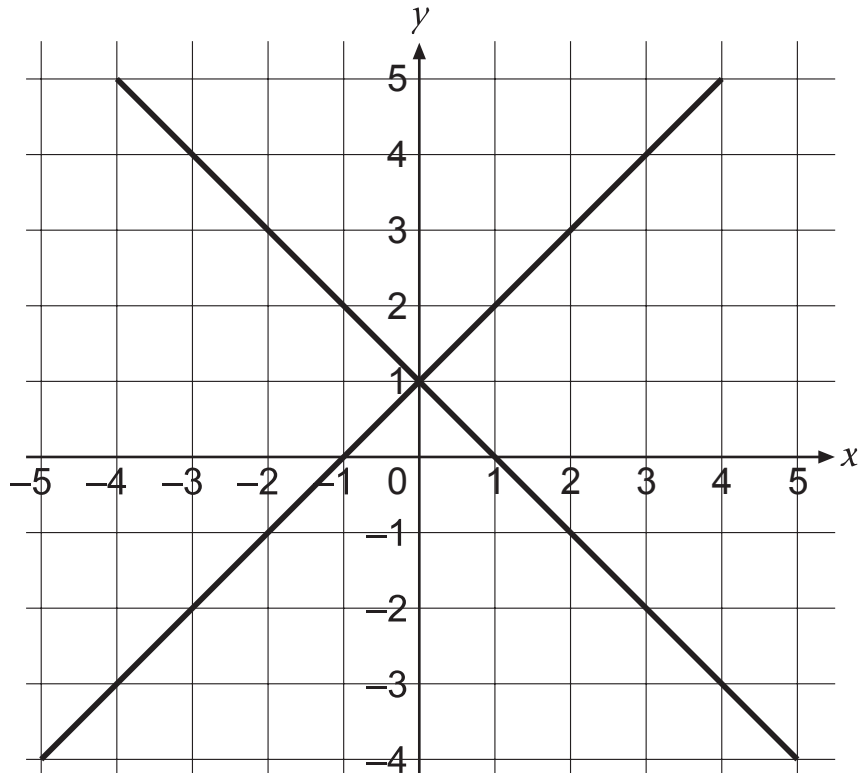
c.



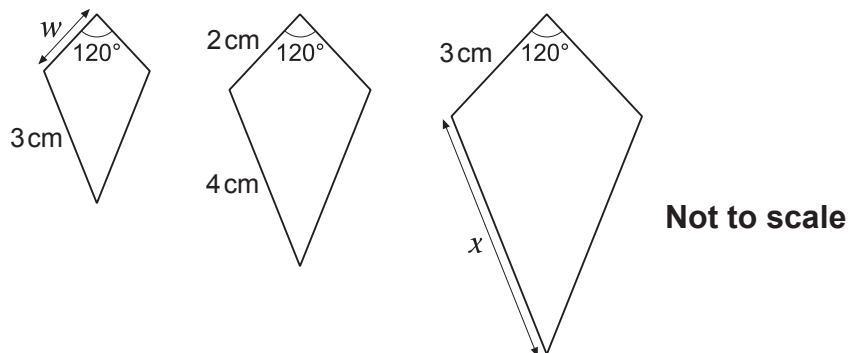
d.



What are the equations of the lines in the diagrams?

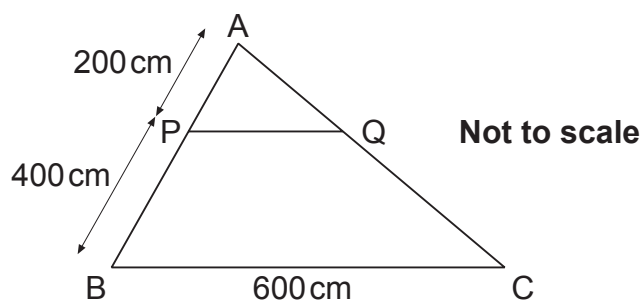


- 1 Sara has made some photocopies of a drawing of a kite. The photocopies are different sizes.

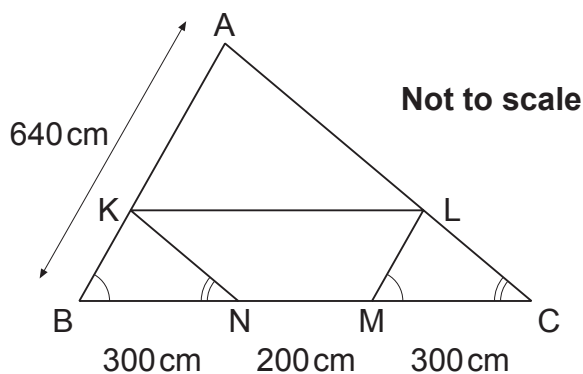


Work out lengths w and x .

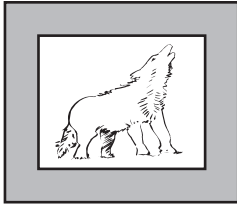
- 2 In the diagram below, PQ is parallel to BC . Calculate length PQ .



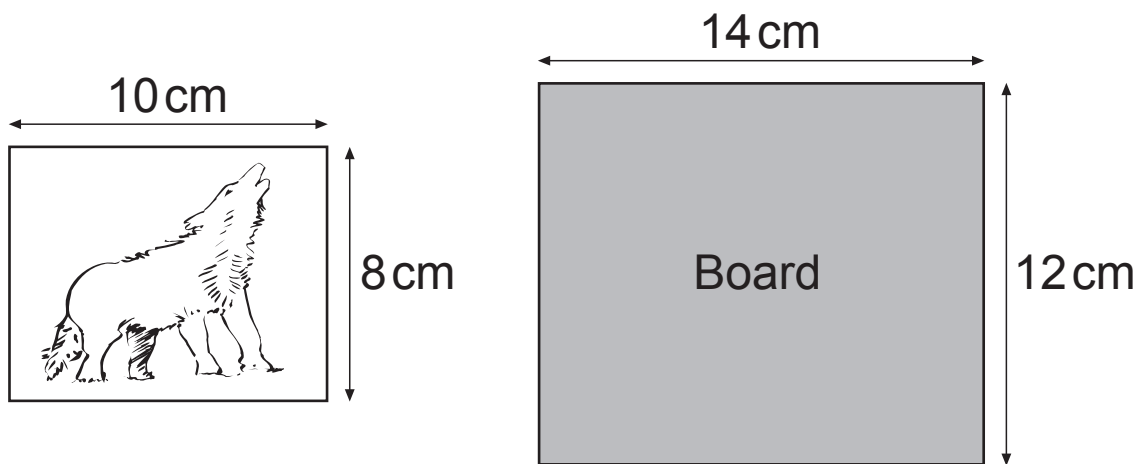
- 3 In the diagram below, angle $ABC =$ angle LMC , and angle $ACB =$ angle KNB . Calculate length LM .



A picture has a board behind it.



The drawings show the dimensions of the rectangular picture and the rectangular board.

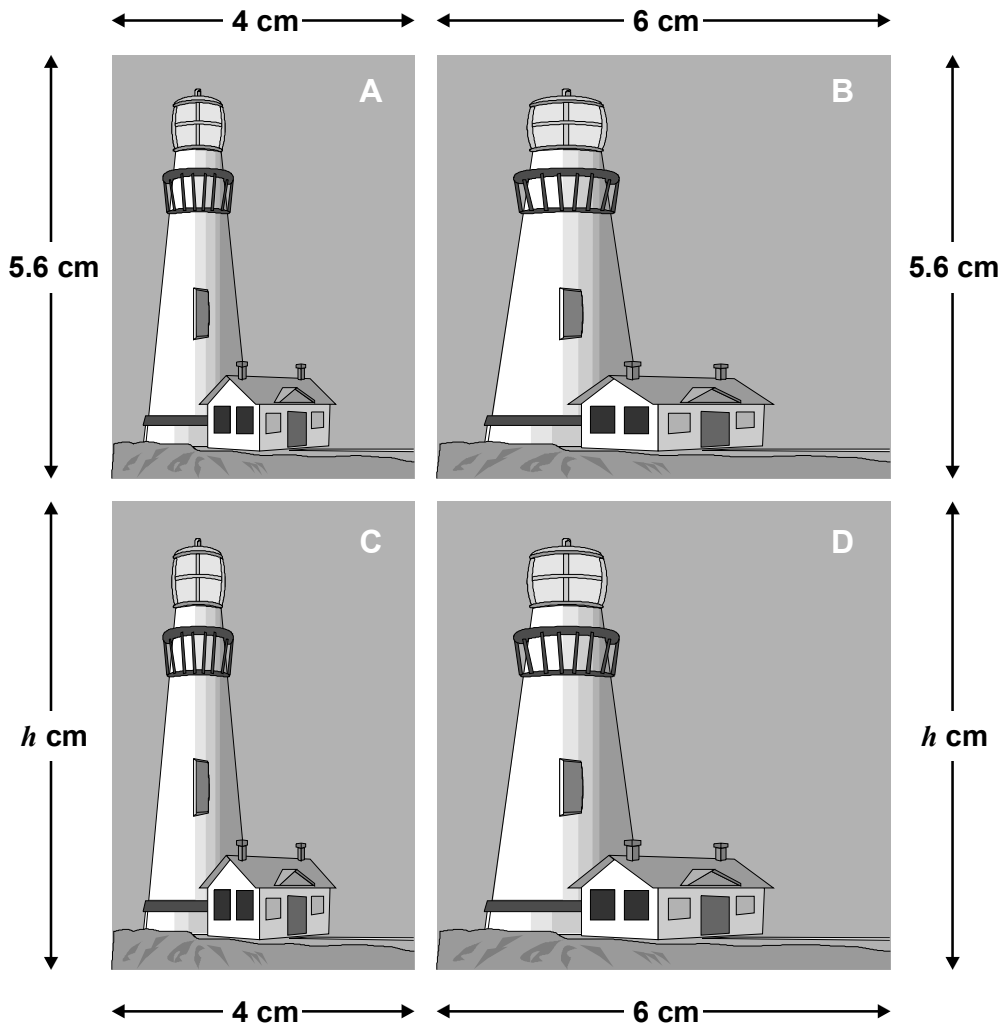


Show that the two rectangles are not mathematically similar.

Suppose that you wanted to cut the board to make it mathematically similar to the picture.

Keep the width of the board as 14 cm.

What should the new height of the board be?

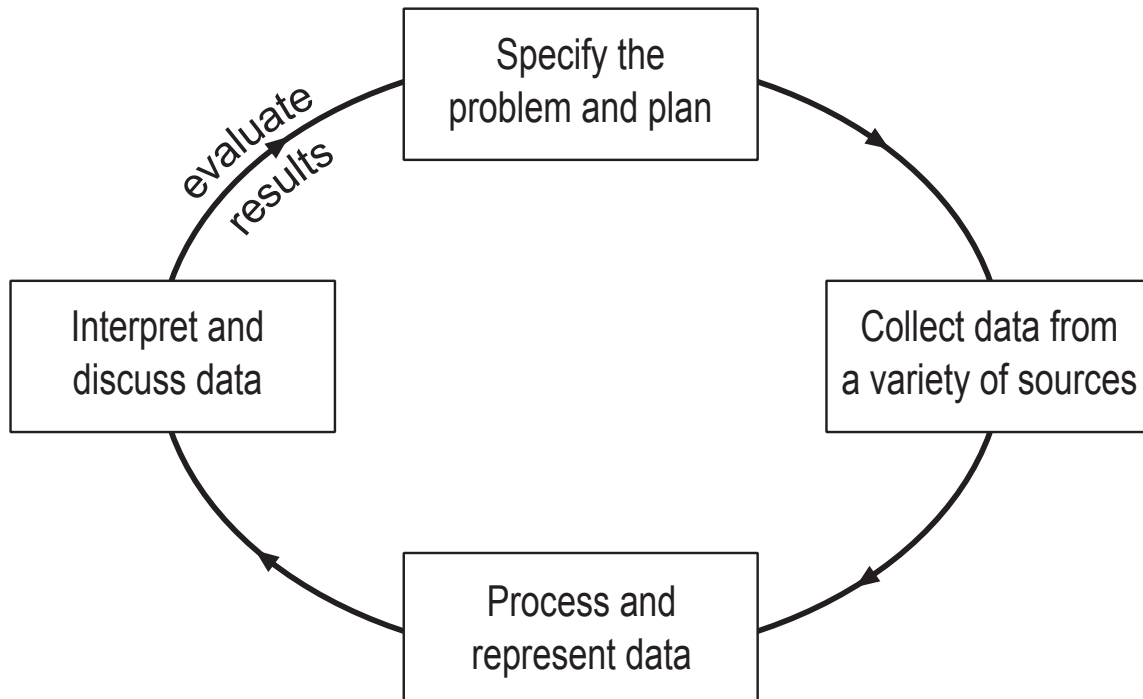


Picture A can be stretched horizontally to make picture B.
Show that the horizontal factor of enlargement is 1.5.

Picture A can be stretched vertically to make picture C.
The vertical factor of enlargement is 1.25.
What is the height of picture C?

Picture E (not shown) is mathematically similar to picture A.
The width of picture E is 3 cm. What is the height of picture E?

The data handling cycle



-
- Specify the problem and plan
 - state problem or topic to investigate
 - make hypothesis of what you think the investigation will show
 - decide how you will choose your sample and size
 - think of any practical problems you foresee
 - identify any sources of bias and plan how to minimise them
 - decide how you will obtain your data
 - identify what extra information may be needed to extend the project
 - Collect data from a variety of sources
 - follow initial plan and use a suitable data-collection sheet
 - Process and represent data
 - analyse your results using appropriate statistical calculations and diagrams
 - Interpret and discuss data
 - compare results with your original hypothesis
 - list any factors which might have affected your results and how you could overcome these in future
 - consider the limitations of any assumptions made
 - come to your final conclusion

You need an open box and some coloured cubes.

You may need a calculator.

One person should secretly choose 10 cubes and put them in the box.

Put the box so that the rest of the group can reach it but cannot see inside.

Do this 10 times, taking turns. Take a cube from the box without looking.

Note the colour of the cube on the table. Replace the cube.

| Colour | Tally | Total |
|--------|-------|-------|
| | | |

Use the data you have collected to guess the contents of the box.

The person who chose the cubes says whether the group is right or wrong.

Repeat the sampling another 10 times.

Use both sets of data to improve your guess.

Carry on repeating the experiment until you think you have worked out the contents of the box correctly.

Is your final answer more accurate than your first answer?

Give a reason why.