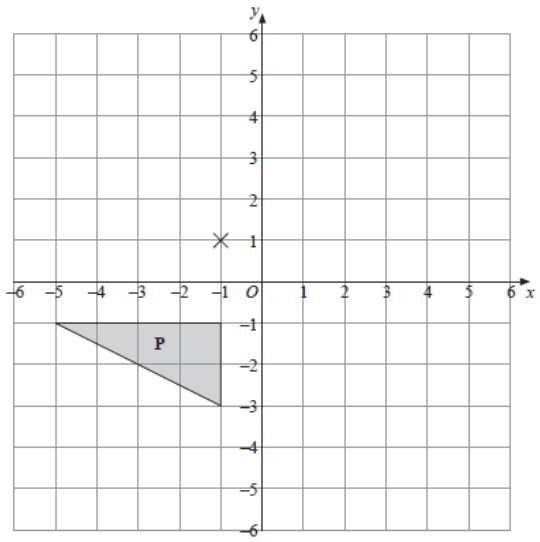
Mock to Mock Intervention Paper 2

Transformations

For support please use www.corbettmaths.com (Video Number 322)

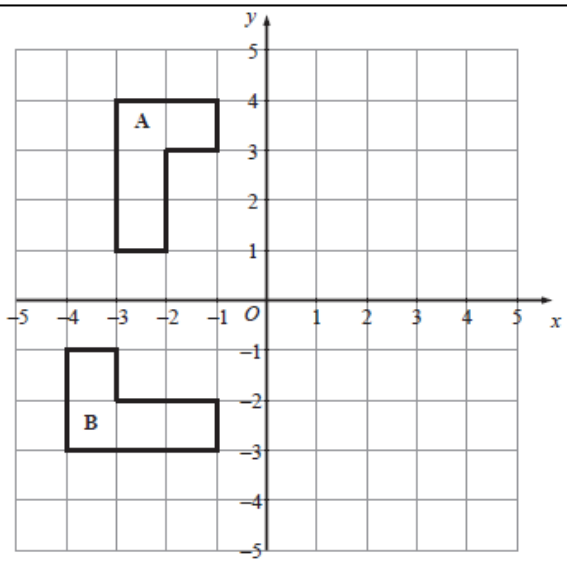


(a) Rotate triangle **P** 180° about the point (–1, 1).

Label the new triangle **A**. **(2)**

(b) Translate triangle **P** by the vector $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$.

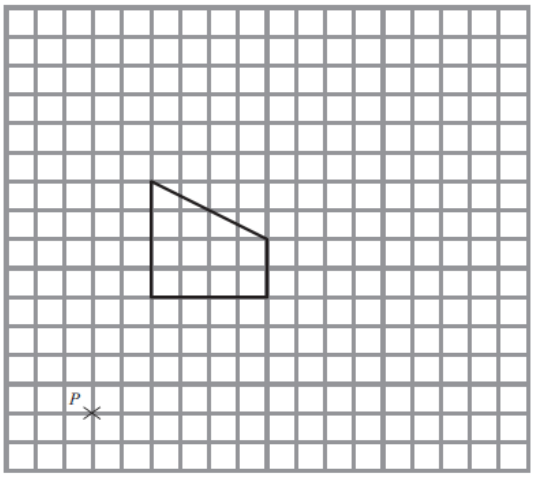
Label the new triangle **B**. **(1)**



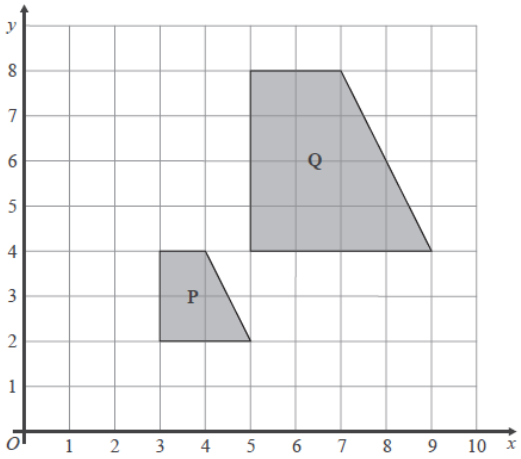
(a) Reflect shape **A** in the y axis.

(b) Describe fully the **single** transformation which takes shape **A** to shape **B**.

9.



On the grid, enlarge the shape with a scale factor of $\frac{1}{2}$, centre P.



Describe fully the single transformation which maps shape **P** onto shape **Q**.

Simultaneous Equations

For support please use www.corbettmaths.com (Video Number 295)

Question 1: Solve the following simultaneous equations by using elimination.

(a) $6x + y = 18$
$4x + y = 14$

(b) $4x + 2y = 10$
$x + 2y = 7$

(c) $9x - 4y = 19$
$4x + 4y = 20$

(d) $2x + y = 36$
$x - y = 9$

(e) $6x - 3y = 12$
$4x - 3y = 2$

(f) $3x - 6y = 6$
$2x - 6y = 3$

(g) $8x + 7y = 39$
$8x + 2y = 34$

(h) $x + 3y = 38$
$x + 6y = 53$

(i) $6x + 3y = 48$
$6x + y = 26$

Question 2: Solve the following simultaneous equations by using elimination.

(a) $3x + 2y = 23$
$2x - y = 6$

(b) $3x - 3y = 9$
$2x + y = 12$

(c) $4x + 2y = 34$
$3x + y = 21$

(d) $9x - 4y = 59$
$2x - y = 12$

(e) $2x + 8y = 43$
$x + 3y = 18$

(f) $6x + 3y = 45$
$2x - 2y = 12$

(g) $5x + 4y = 130$
$x + 6y = 130$

(h) $10x - 15y = 25$
$x - 2y = 1$

(i) $3x + 8y = 97$
$2x + 4y = 58$

The cost of buying a coffee and a tea in a cafe is £4
The cost of buying a coffee and three teas in a cafe is £7
Work out the cost of buying a coffee and the cost of buying a tea.

The sum of Rosemary's age and Hannah's age is 102 years.
The difference between Rosemary's and Hannah's age is 52 years.
Rosemary is older than Hannah.
Find the age of each woman by using simultaneous equations.

Five adult tickets and three child tickets for a movie cost £58.
Two adult tickets and eight child tickets for a movie cost £47.
Find the cost of each type of ticket.

Exchange Rates

For support please use www.corbettmaths.com (Video Number 214a)

Question 1: Nicola went to Italy. She changed £800 into euros (€).
The exchange rate was £1 = €1.40
Change £800 into euros.

Question 2: A new TV in Tokyo costs ¥53380
The exchange rate is £1 = ¥157
How much is the TV in pounds?

Question 3: In Lisbon, a watch costs €80.
In Liverpool, the same watch costs £65.
The exchange rate is £1 = €1.25

Work out the difference in cost.

Question 4: Below are the prices of the same car in different countries.
£1 = €1.18 £1 = ¥140 £1 = $1.25

USA	Ireland	England	Japan
$20000	€17500	£15000	¥3000000

In which country is the car the best value?

Ratio

For support please use www.corbettmaths.com (Video Number 269-270)

1. Alex and Thomas share 30 sweets. They divide them in the ratio 3:2.
   How many sweets does Thomas have?

2. Sophie has 60 pencils. The ratio of sharpened pencils to blunt pencils is 4:1
   How many sharpened pencils does Sophie have?

3. The number of people who voted for the Green Party in an election was 1500. The number of people who voted for the Blue Party was 9000.
   Write the ratio of Green Party voters to Blue Party voters in its simplest form.

4. A piece of carpet is 240cm long. Mr Jones cuts it into three pieces in the ratio 1: 2: 5
   Work out the length of the longest piece of carpet.

5. Sarah has some chocolates. 24 are white chocolate. 16 are milk chocolate. 8 are dark chocolate.
   (a) Write down the ratio of white chocolate to milk chocolate to dark chocolate.
   Give your ratio in its simplest form.
   Rachel has some apples and bananas. The ratio of apples to bananas is 2: 3 she has 14 apples.
   (b) Work out how many bananas Rachel has.

6. Divide £945 in the ratio 2 : 5

7. 4 schools sent students to a languages course. One of the schools sent both French and German students.
   The ratio of French to German students it sent was 1: 3. The school sent 21 German students. The other 3 schools sent the same number of students.
   Work out the total number of students sent to the languages course.

Proportion

For support please use www.corbettmaths.com (Video Number 254-256)

1. Y is directly proportional to the square of x. When y = 24, x = 2.
   Find the value of y when x = 4.

2. The cost of a circular table is directly proportional to the square of the radius. A circular table with a radius of 40cm cost £50.
   What is the cost of a circular table with a radius of 60cm?

3. The time taken, t seconds, that it takes a water heater to boil water is inversely proportional to the power, p watts, of the water heater. When P = 2000W, T = 252 seconds.
   Find the time it takes to boil water when P = 800W

4. H varies directly to the cube of c. When H = 40, c = 2.
   (a) Express H in terms of c.
   (b) Find the value of H when c = 5.
   (c) Find the value of c when H = 5000.

5. The force, F newton's, exerted by a magnet on a metal object is inversely proportional to the square of the distance d cm.

When d = 2 cm, F = 50 N.

(a) Express F in terms of d.
(b) Find the force when the distance between the magnet and metal object is 10cm
(c) Find the distance between the magnet and metal object when the force is 8N.
(d) Explain what happens to F when d is halved.

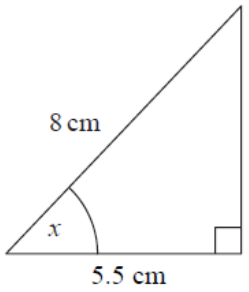
6. A and B are positive numbers. A is inversely proportional to B. When A = 4, B = 36. Find the value of A when B = A.

7. C is directly proportional to the square root of y. When C = 12.8, y = 16.
(a) Express C in terms of y.
(b) Find C when y = 400

Trigonometry

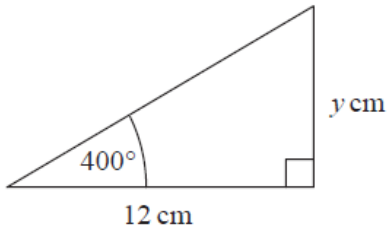
For support please use www.corbettmaths.com (Video Number 329-331)

Here is a right-angled triangle.



(a) Calculate the size of the angle marked x.
Give your answer correct to 1 decimal place.

Here is another right-angled triangle.



(b) Calculate the value of y.
Give your answer correct to 1 decimal place.

Town B is 4.6 km due West of town C.
Town A is 2.3 km due North of town B.

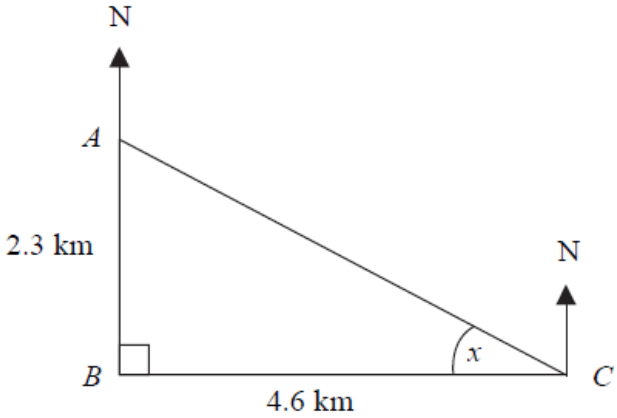


Diagram **NOT** accurately drawn

(a) Calculate the size of the angle marked x.
Give your answer correct to 3 significant figures.

(b) Find the bearing of town C from town A.
Give your answer correct to 3 significant figures.