Grade D topics

Factors, Multiples and Primes

1) Write the factors of

a) 6 b) 16 c) 18 d) 30

2) In a pupil's book the factors of 12 are listed as

1 2 3 4 5 12

The above list contains a mistake.

Cross it out from the list and replace it with the correct number.

3) The factors of 30 and 40 are listed

30: 1, 2, 3, 5, 6, 10, 15, 30
40: 1, 2, 4, 5, 8, 10, 20, 40

Write the common factors of 30 and 40 (the numbers that are factors of 30 and 40).

4) Write the first four multiples of

a) 3 b) 5 c) 10 d) 15

5) In a pupil's book the first 7 multiples of 8 are listed as

8 16 22 32 40 48 54

The above list contains 2 mistakes.
Cross them out and replace them with the correct numbers.

6) The first five multiples of 4 and 10 are listed

4: 4, 8, 12, 16, 20
10: 10, 20, 30, 40, 50

From the two lists above, write the common multiple of 4 and 10.

7) List the first five prime numbers

8) Using just this list of numbers:

11 18 1 4 21 24 9 3 12 2 19

find the following:

a) The prime numbers

b) The factors of 18

c) The multiples of 3

Evaluate Powers

1) Evaluate the following:

a) 2^3

b) 3^2

c) 10^4

2) Evaluate the following:

a) 2^8

b) 6^4

c) 5^6

3) Find the value of

a) $2^4 + 3^2$

b) $5^2 - 2^3$

c) $1^2 + 2^2 + 3^2$

4) Find the value of

a) $5^4 + 6^3$

b) $3^4 \times 2^5$

c) $9^3 - 6^3$

5) Find the value of

$2^2 + 3^2 + 5^2 + 7^2 + 11^2 + 13^2 + 17^2$

Understanding Squares, Cubes & Roots

1) What is the value of 5^2?

2) What is the value of 8^2?

3) These are the first five square numbers: 1, 4, 9, 16, 25

a) What is the sixth square number?

b) What is the 10th square number?

4) Which square number lies between 60 and 70?

5) What is the value of 2^3?

6) What is the value of 4^3?

7) Work out $1^3 + 2^3 + 3^3$

8) Work out $\sqrt{25}$

9) Work out $\sqrt{49}$

10) Work out the value of $\sqrt{121} \times \sqrt{121}$

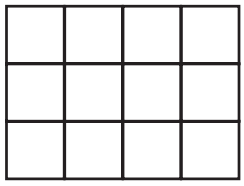
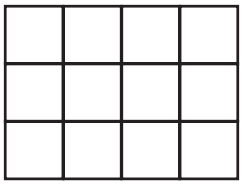
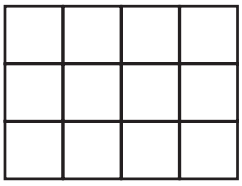
11) Match together cards with the same answer

9^2	$\sqrt{9}$	81	5^3
2^5	125	32	3

Equivalent Fractions

1) Each of the grids below has a fraction written at the side of it.

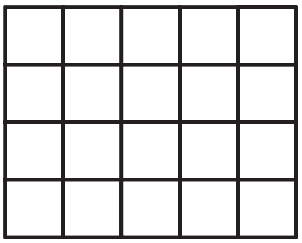
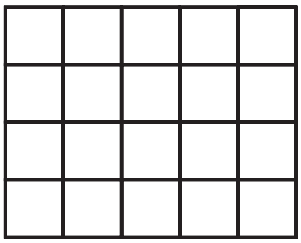
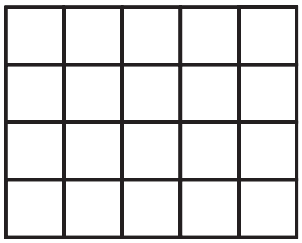
a) Shade the grids to show these fractions.

$\frac{8}{12}$  $\frac{4}{6}$  $\frac{2}{3}$ 

b) What do you notice about how many little squares are shaded in each grid?

2) Each of the grids below has a fraction written at the side of it.

a) Shade the grids to show these fractions.

$\frac{2}{5}$  $\frac{4}{10}$  $\frac{8}{20}$ 

b) What do you notice about how many little squares are shaded in each grid?

3) Find the missing values in these equivalent fractions.

$$\frac{1}{2} = \frac{2}{\square} = \frac{3}{\square} = \frac{4}{\square}$$

4) Find the missing values in these equivalent fractions.

$$\frac{2}{5} = \frac{6}{\square} = \frac{\square}{30} = \frac{14}{\square}$$

5) How do you know that $\frac{3}{7}$ is not equivalent to $\frac{25}{56}$?

Simplification of Fractions

1) Write the following fractions in their simplest forms

a) $\frac{2}{4}$

b) $\frac{5}{10}$

c) $\frac{4}{6}$

d) $\frac{6}{9}$

e) $\frac{12}{15}$

f) $\frac{8}{12}$

g) $\frac{15}{20}$

2) Write the following fractions in their simplest forms

a) $\frac{9}{30}$

b) $\frac{14}{18}$

c) $\frac{7}{49}$

d) $\frac{48}{72}$

e) $\frac{60}{75}$

f) $\frac{15}{27}$

g) $\frac{72}{96}$

Ordering Fractions

1) Put these fractions in order of size, smallest to largest.
Show your working for each question.

a) $\frac{1}{2}$ $\frac{1}{3}$

b) $\frac{3}{5}$ $\frac{2}{3}$

c) $\frac{1}{2}$ $\frac{3}{8}$

2) Put these fractions in order of size, smallest to largest.
Show your working for each question.

a) $\frac{1}{2}$ $\frac{1}{4}$ $\frac{3}{8}$

b) $\frac{3}{5}$ $\frac{1}{2}$ $\frac{3}{4}$

c) $\frac{5}{6}$ $\frac{2}{3}$ $\frac{3}{4}$

3) Put these fractions in order of size, smallest to largest.
Show your working for each question.

a) $\frac{2}{3}$ $\frac{7}{12}$ $\frac{3}{4}$ $\frac{5}{6}$

b) $\frac{5}{8}$ $\frac{2}{3}$ $\frac{3}{24}$ $\frac{7}{12}$

c) $\frac{6}{10}$ $\frac{4}{5}$ $\frac{5}{12}$ $\frac{8}{15}$

4) Ben spent his pocket money this way:

$\frac{7}{20}$ on magazines

$\frac{4}{10}$ on chocolates

$\frac{1}{4}$ on games

Order the items Ben bought by value, largest first.
Show all your working.

Value for Money

1) Which of the following offer better value for money?
Working must be shown

a) 200ml of toothpaste for 50p or 400ml of toothpaste for 90p

b) 600g of bananas for 70p or 200g of bananas for 22p

c) 2 litres of paint for £1.60 or 5 litres of paint for £3.50

d) 60 teabags for £1.62 or 40 teabags for £0.96

2) Which of these is the best buy?

20 exercise books for £4.00	35 exercise books for £7.80

3) Hamza needs to buy 2 litres of paint.

At the shop he gets two choices:

500ml for £2.55 or 1 litre for £4.79.

a) Work out which of these would be the best buy for Hamza.

b) How much does he save if he buys the 'best buy' rather than the 'worst buy'?

You must show all your working.

4) Honey pots are sold in two sizes.

A small pot costs 45p and weighs 450g.
A large pot costs 80p and weighs 850g.

Which pot of honey is better value for money?
You must show all your working.

Find a Percentage with a Calculator

1) Work out:

a) 21% of £340

b) 64% of £1080

c) 36% of £800

d) 98% of £13

2) Work out:

a) 17.5% of £58

b) 20% of £5.40

c) 61.7% of £2000

d) 17.5% of £68.40

3) A computer costs £406 plus VAT at 20%.
Work out the total cost of the computer.

4) A car is usually priced at £9800 but now has a discount of 8%.
What is the new price of the car?

5) 9500 people attend a festival and 22% of them are children.
How many children are at the festival?

6) 65% of a car, by weight, is steel and iron.
If a car weighs 1100 kg, what is the weight of steel and iron in the car?

7) Tony earns £17800 per year and receives a 3.8% pay rise.
How much does he now earn?

Find a Percentage without a Calculator

1) Work out:

a) 10% of £170

b) 10% of £6800

c) 10% of £923

d) 10% of £16

2) Work out:

a) 20% of £60

b) 30% of £90

c) 15% of £800

d) 15% of £68

3) Work out:

a) 35% of £80

b) 90% of £160

c) 17.5% of £600

d) 17.5% of £850

4) Work out:

a) 15% of £4.60

b) 40% of £2.80

c) 17.5% of £3.20

d) 97.5% of £24

5) The normal price of a jacket is £54.
In a sale, the price is reduced by 30%
What is the sale price?

6) A football costs £14 plus 20% VAT.
How much is the football?

Change to a Percentage with a Calculator

1) Write the following as percentages, giving all your answers to 1 decimal place.

a) 12 out of 34

b) 62 out of 85

c) 113 out of 153

d) 2150 out of 3452

2) Sarah sat a Science test and got a score of 64 marks out of 112 possible marks.

What was her mark as a percentage?
Give your answer to 1 decimal place.

3) In a class of 32 students, 18 of them are boys.

What percentage of the class are boys?
Give your answer to 1 decimal place.

4) In a French class there are 13 girls and 6 boys.

What percentage of the class are girls?
Give your answer to 1 decimal place.

5) A new car usually costs £8500.

Henry gets a discount of £1000.

What is the discount as a percentage of the usual cost?
Give your answer to 1 decimal place.

6) Write out £148 as a percentage of £600.
Give your answer to 1 decimal place.

7) In a wood there are 200 oak trees, 650 silver birch trees and 400 wild cherry trees.

What percentage of the trees are oak trees?

8) In England in 2010 there were 68820 deaths caused by cancer.

Of these deaths, 37500 were caused by smoking.

What percentage of deaths due to cancer were caused by smoking?
Give your answer to 1 decimal place.

Change to a Percentage without a Calculator

1) Write the following as percentages.

a) 12 out of 50

b) 15 out of 25

c) 8 out of 10

d) 11 out of 20

e) 4 out of 5

f) 32 out of 40

g) 12 out of 80

h) 640 out of 800

i) 36 out of 60

2) Tim got 17 out of 20 in a French test.
Write 17 out of 20 as a percentage.

3) Write £19 as a percentage of £25

4) Work out £14 as a percentage of £40

5) A baker burnt 12 loaves out of the 200 loaves he baked.
What percentage of the 200 loaves did he burn?

6) What is £380 as a percentage of £400?

7) What is £22 as a percentage of £40?

8) If there are 9 girls and 11 boys in a class, what percentage of the class are girls?

Finding a Fraction of an Amount

1) Work out these amounts.

a) $\frac{3}{4}$ of £20 b) $\frac{2}{3}$ of 60 kg c) $\frac{3}{8} \times 24$

d) $150 \times \frac{2}{3}$ e) $\frac{2}{9}$ of 180 cm f) $49 \times \frac{4}{7}$

g) $60 \times \frac{1}{4}$ h) $\frac{5}{8}$ of £48 i) $4000 \times \frac{7}{8}$

2) There are 600 apples on a tree and there are maggots in $\frac{3}{5}$ of them.

How many apples have maggots in them?

3) Liz and Lee are travelling in a car from Glasgow to Poole (770 km).

At midday they had already travelled $\frac{5}{7}$ of the total distance.

What distance, in km, had they travelled by midday?

4) A digital camera that cost £49 was sold on eBay for $\frac{3}{7}$ of the original price.

What was the selling price?

5) Yesterday Thomas travelled a total of 175 miles.

He travelled $\frac{2}{5}$ of this distance in the morning.

How many miles did he travel during the rest of the day?

6) Debra received her £15 pocket money on Saturday.

She spent $\frac{1}{3}$ of her pocket money on magazines.

She spent $\frac{2}{5}$ of her pocket money on a necklace.

How much of the £15 did she have left?

Addition and Subtraction of Fractions

In all the questions on this page, please give your answers in their simplest form.

1) Work out the following:

a) $\frac{1}{7} + \frac{3}{7}$

b) $\frac{4}{9} + \frac{1}{9}$

2) Work out the following:

a) $\frac{1}{5} + \frac{3}{4}$

b) $\frac{3}{8} + \frac{1}{4}$

c) $\frac{2}{3} + \frac{3}{10}$

d) $\frac{1}{2} + \frac{2}{5}$

3) Work out the following:

a) $\frac{2}{3} + \frac{1}{2}$

b) $\frac{3}{5} + \frac{2}{3}$

c) $\frac{5}{8} + \frac{3}{4}$

d) $\frac{5}{7} + \frac{2}{5}$

4) Work out the following:

a) $2\frac{1}{2} + 1\frac{3}{4}$

b) $1\frac{2}{5} + \frac{2}{3}$

c) $2\frac{1}{6} + 1\frac{1}{2}$

d) $1\frac{3}{7} + \frac{2}{5}$

5) Work out the following:

a) $\frac{3}{4} - \frac{1}{2}$

b) $\frac{5}{7} - \frac{2}{3}$

c) $\frac{5}{8} - \frac{1}{3}$

d) $\frac{8}{9} - \frac{2}{3}$

6) Work out the following:

a) $2\frac{1}{2} - 1\frac{3}{4}$

b) $1\frac{2}{3} - \frac{3}{4}$

c) $3\frac{2}{5} - 1\frac{1}{2}$

d) $2\frac{3}{8} - \frac{3}{5}$

7) Ted received his pocket money on Friday.

He spent $\frac{3}{5}$ of his pocket money on games.

He spent $\frac{1}{10}$ of his pocket money on magazines.

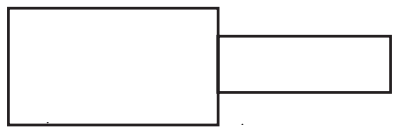
What fraction of his pocket money did he have left?

8) Maisie buys a bag of flour.

She uses $\frac{1}{4}$ to bake a cake and $\frac{2}{5}$ to make a loaf.

a) What fraction of the bag of flour was used?
b) What fraction of the bag of flour is left?

9) Work out the total length of this shape.
Give your answer as a mixed number.



Multiplication and Division of Fractions

In all the questions on this page, please give your answers in their simplest form.

1) Work out the following:

a) $\frac{1}{2} \times \frac{1}{2}$

b) $\frac{2}{3} \times \frac{1}{3}$

c) $\frac{3}{5} \times \frac{2}{7}$

d) $\frac{4}{7} \times \frac{5}{9}$

2) Work out the following:

a) $\frac{1}{2} \times \frac{2}{3}$

b) $\frac{3}{4} \times \frac{8}{11}$

c) $\frac{2}{9} \times \frac{3}{4}$

d) $\frac{4}{5} \times \frac{1}{12}$

3) Work out the following:

a) $1\frac{1}{2} \times \frac{1}{3}$

b) $\frac{2}{3} \times 2\frac{2}{5}$

c) $3\frac{1}{2} \times 1\frac{1}{2}$

d) $1\frac{2}{7} \times 3\frac{1}{3}$

4) Work out the following:

a) $\frac{2}{5} \div \frac{3}{4}$

b) $\frac{1}{7} \div \frac{3}{5}$

c) $\frac{4}{9} \div \frac{1}{2}$

d) $\frac{3}{10} \div \frac{5}{9}$

5) Work out the following:

a) $\frac{1}{2} \div \frac{1}{3}$

b) $\frac{3}{7} \div \frac{4}{7}$

c) $\frac{1}{9} \div \frac{2}{3}$

d) $\frac{2}{5} \div \frac{3}{10}$

6) Work out the following:

a) $1\frac{1}{3} \div \frac{1}{4}$

b) $\frac{3}{5} \div 2\frac{2}{3}$

c) $3\frac{2}{3} \div 1\frac{1}{5}$

d) $4\frac{1}{2} \div 1\frac{1}{2}$

Change Fractions to Decimals

Write the following fractions as decimals

1) $\frac{3}{10}$

2) $\frac{7}{10}$

3) $\frac{9}{100}$

4) $\frac{1}{2}$

5) $\frac{3}{4}$

6) $\frac{2}{5}$

7) $\frac{7}{20}$

8) $\frac{1}{3}$

9) $\frac{1}{8}$

10) $\frac{5}{8}$

BODMAS

Work out the following.  for all questions.

1) $6 \times 5 + 2$

2) $2 + 6 \times 5$

3) $35 - 4 \times 3$

4) $48 \div (14 - 2)$

5) $27 \div (3 + 6)$

6) $27 \div 3 + 6$

7) $(9 + 2) \times 2 + 5$

8) $4 \times (1 + 4) - 6$

9) $6 \times 4 - 3 \times 5$

10) $\dfrac{9+3}{4+2}$

11) $\dfrac{23+9}{7-3}$

12) $\dfrac{7-2^2}{4^2-15}$

13) $\dfrac{5^2+3}{2\times 7}$

14) $\dfrac{5\times 6-4}{13}$

15) $\dfrac{8\times 2-4}{3+1^2}$

16) $\dfrac{12-3\times 2}{14\div 7}$

17) $\dfrac{20-3^2}{10-(5+4)}$

18) $\dfrac{3+9\times 8}{1+6\times 4}$

Long Multiplication with Decimals

1) Work out

a) £1.42 × 3

b) £2.64 × 7

c) £213 × 16

d) £32.40 × 23

2) David buys 5 books for £8.75 each.
How much does he pay?

3) A DVD costs £12.25.
Work out the cost of 9 of these DVDs.

4) John takes 27 boxes out of his van.
The weight of each box is 41.7 kg.
Work out the total weight of the 27 boxes.

5) Nina bought 43 teddy bears at £9.35 each.
Work out the total amount she paid.

6) Elliott goes shopping.
He buys
0.5 kg of pears at £0.84 per kg.
2.5 kg of grapes at £1.89 per kg.
6 kg of potatoes at £0.25 per kg.

How much does he pay?

7) Brian hires a car for 3 days.
Tariffs are:
£44.80 for the first day and
£37.50 for each extra day.

How much does he pay?

Ratio

1) Write the following ratios in their simplest form:

a) 6 : 9

b) 10 : 5

c) 7 : 21

d) 4 : 24

e) 12 : 40

f) 4 : 2 : 8

g) 18 : 63 : 9

2) Write the missing value in these equivalent ratios:

a) 3 : 5 = 12 : ☐

b) 4 : 9 = ☐ : 27

c) ☐ : 7 = 16 : 14

3) The ratio of girls to boys in a class is 4 : 5.

What fraction of the class are girls?

4) A model of a plane is made using a scale of 1 : 5.

a) If the real length of the plane is 20 m, what is the length of the model?

b) If the wings of the model are 1.2 m long, what is the actual length of the wings on the plane?

Proportion Recipe Type Questions

1) Here are the ingredients needed to make 8 pancakes.
James makes 24 pancakes.

Pancakes
Ingredients to make **8** pancakes

250 ml milk
1 egg
140 g flour
5 g butter

a) Work out how much milk he needs.

Kate makes 12 pancakes.

b) Work out how much flour she needs.

2) Here are the ingredients for making fish pie for 6 people.

Fish pie for 6 people
180 g flour
240 g fish
80 g butter
4 eggs
180 ml milk

Jill makes a fish pie for 3 people.
a) Work out how much flour she needs.

Tim makes a fish pie for 15 people.

b) Work out how much milk he needs.

3) Here are the ingredients for making pineapple sorbet for **6** people.

Pineapple sorbet for 6 people
800 g of pineapple
4 egg whites
½ lemon
100 g caster sugar

Trevor makes pineapple sorbet for 18 people.

a) Work out how much caster sugar he uses.

Sid makes a pineapple sorbet.
He uses 2 lemons.

b) Work out how many people he makes pineapple sorbet for.

Hard Calculator Questions

1) Use your calculator to work out

$$\frac{23.7 \times 14.2}{8.4 \times 3.2}$$

Write down all the figures on your calculator display.

2) Use your calculator to work out

$$\frac{\sqrt{21.4}}{5.7 - 2.35}$$

Write down all the figures on your calculator display.

3) Work out $\dfrac{5.8 + 4.65}{3.1^2 + 1.62}$

Write down all the figures on your calculator display.

4) Use your calculator to work out the value of

$$\frac{9.2 \times 16.3}{9.4 - 5.71}$$

Write down all the digits from your calculator.
Give your answer as a decimal.

5) Use your calculator to work out

$$\frac{3}{2.1 + 3.45}$$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

6) Use your calculator to work out

$$\frac{15^2 - 12^2}{\sqrt{9.6 - 3.87}}$$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

7) Use a calculator to work out

$$\sqrt{\frac{22.4 \times 13.9}{3.6}}$$

Write down all the figures on your calculator display.

Real-Life Money Questions

1) Lance goes on holiday to France.
The exchange rate is £1 = 1.15 Euros.

He changes £350 into Euros.

a) How many Euros should he get?

In France, Lance buys a digital camera for 115 Euros.

b) Work out the cost of the camera in pounds.

2) Whilst on holiday in Spain, Gemma bought a pair of sunglasses for 77 Euros.
In England, an identical pair of sunglasses costs £59.99.
The exchange rate is £1 = 1.40 Euros.

In which country were the glasses the cheapest, and by how much?
Show all your working.

3) Luke buys a pair of trainers in Switzerland.
He can pay either 86 Swiss Francs or 56 Euros.
The exchange rates are:
£1 = 2.10 Swiss Francs
£1 = 1.40 Euros

Which currency should he choose to get the best price, and how much would he save?
Give your answer in pounds (£).

4) The exchange rate in London is £1 = €1.14
The exchange rate in Paris is €1 = £0.86

Tony wants to change some pounds into euros.

In which of these cities would Tony get the most euros?
All working must be shown.

5) The total cost of 5 kg of potatoes and 2 kg of carrots is £4.88.
3 kg of potatoes cost £1.98.

Work out the cost of 1 kg of carrots.

Real-Life Money Questions

1) The cost of 4 kg of bananas is £5.80.
The total cost of 3 kg of bananas and 1.5 kg of pears is £5.61.

Work out the cost of 1 kg of pears.

2) In July 2007, Peter hired a car in Italy.
The cost of hiring the car was £620
The exchange rate was £1 = €1.25

a) Work out the cost of hiring the car in euros (€).

Peter bought some perfume in Italy.
The cost of the perfume in Italy was €50
The cost of the same perfume in London was £42

The exchange rate was still £1 = €1.25

b) Work out the difference between the cost of the perfume in Italy and the cost of the perfume in London.
Give your answer in pounds (£).

3) Jill wants to work out how much tax she needs to pay.

Last year she earned £19000

She does not pay Income tax on the first £6475 she earned.
She pays tax of 20 pence for each pound she earned above £6475.

She pays the tax in two equal half-yearly instalments.

a) How much Income tax does Jill pay in her first half-yearly instalment?

Jill wants to know what percentage of her earnings she pays in tax.

b) Calculate the Income tax Jill has to pay as a percentage of her earnings last year.
Give your answer correct to 1 decimal place.

Generate a Sequence from the *N*th Term

1) The *n*th term of a number sequence is $2n + 5$

Write down the first three terms of the sequence.

2) The *n*th term of a number sequence is $3n - 1$

Write down the first four terms of the sequence.

3) The *n*th term of a number sequence is $3n + 2$

Write down the first four terms of the sequence.

4) The *n*th term of a number sequence is $5n - 7$

Write down the first four terms of the sequence.

5) The *n*th term of a number sequence is n^2

Write down the first three terms of the sequence.

6) The *n*th term of a number sequence is $n^2 + 3$

Write down the first three terms of the sequence.

7) The *n*th term of a number sequence is $11 - n^2$

a) Find the third term of this sequence.

b) Find the fifth term of this sequence.

8) The *n*th term of a number sequence is $n^2 + n$

a) Find the third term of this sequence.

b) Find the fifth term of this sequence.

Substitution

1) $y = 5x$

a) Work out the value of y when $x = 3$

b) Work out the value of y when $x = -2$

2) $y = 2x + 7$

a) Work out the value of y when $x = 4$

b) Work out the value of y when $x = -3$

3) $y = 2x + 4t$

$x = 6$

$t = 1$

Work out the value of y.

4) $y = 2a - 3b$

$a = 4$

$b = -2$

Work out the value of y.

5) $v = 3a + 5b$

$a = 6$

$b = -3$

Work out the value of v.

6) $y = x^2$

a) Work out the value of y when $x = 6$

b) Work out the value of y when $x = -4$

7) $y = 2x^2$

a) Work out the value of y when $x = 5$

b) Work out the value of y when $x = -3$

8) $y = 3x^2 + 2x$

a) Work out the value of y when $x = 2$

b) Work out the value of y when $x = -4$

9) $v = u^2 + 5as$

$u = 6$
$a = 2.5$
$s = 9$

Work out the value of v.

10) $y = p - 2qx^2$

$p = -10$

$q = 2$

$x = -5$

Work out the value of y.

11) $v^2 = u^2 + 2as$

$u = 6$
$a = 2.5$
$s = 9$

Work out the value of v.

12) $v^2 = u^2 + 2as$

$u = 3$
$a = 9.8$
$s = 12$

Work out the value of v.
Give your answer correct to 1 decimal place

13) $s = ut + 0.5at^2$

$a = 9.8$
$t = 5$
$u = 7$

Work out the value of s.

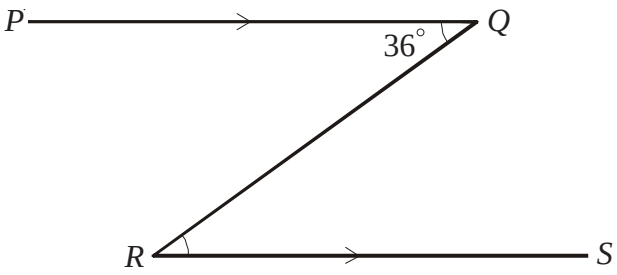
Parallel Lines

1) Line *PQ* is parallel to line *RS*.

If angle *PQR* is equal to 36°

a) What is the size of angle *QRS*?

b) Give a reason for your answer.

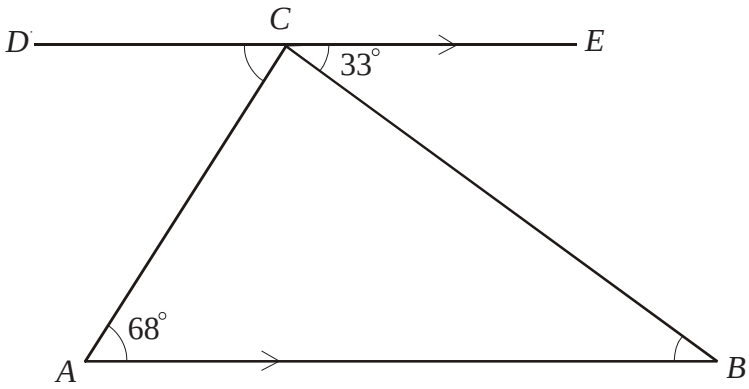


2) Line *DCE* is parallel to line *AB*

a) Find the size of angle *ABC*

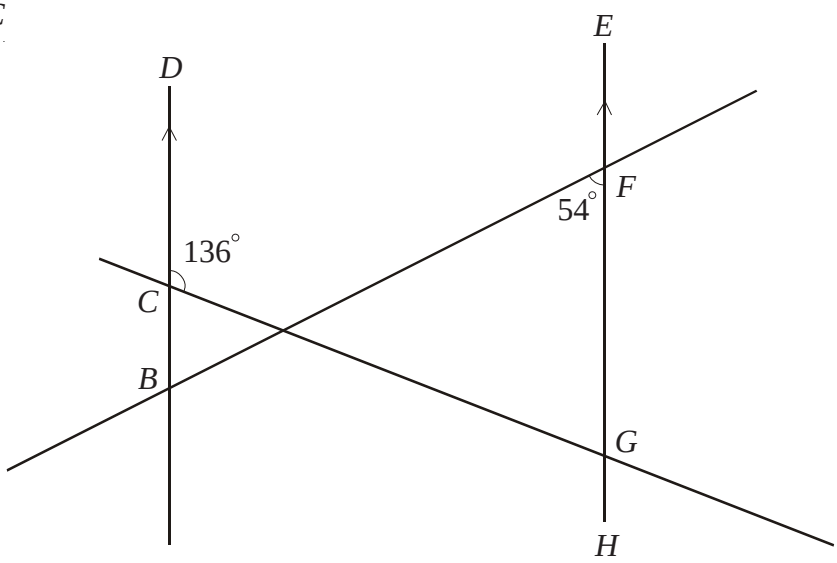
b) Find the size of angle *DCA*

c) Calculate the size of angle *ACB*



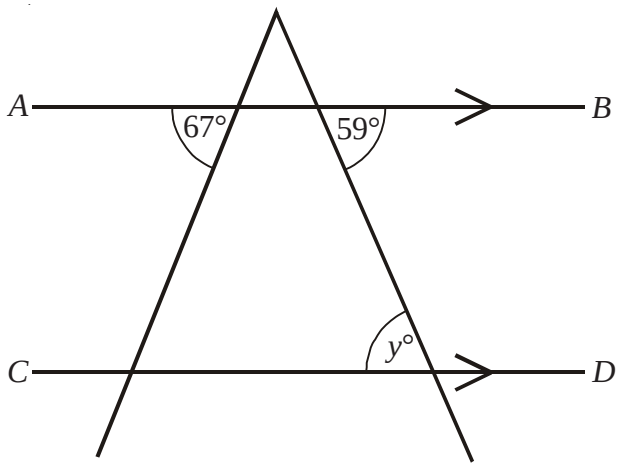
3) a) Find the size of angle *DBF*

b) Find the size of angle *HGC*



Parallel Lines

1)

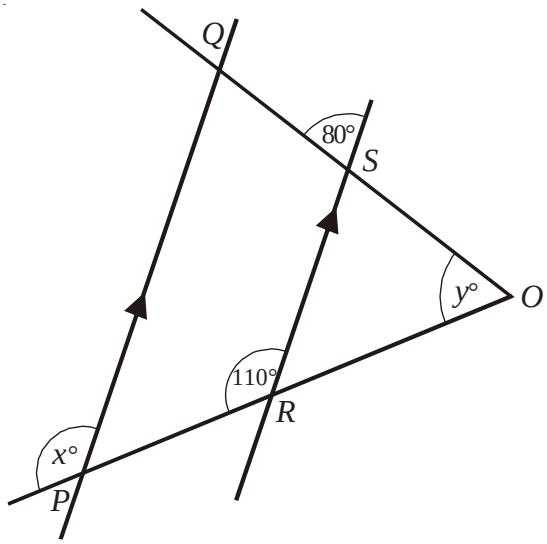


AB is parallel to *CD*.

(i) Write down the value of *y*.

(ii) Give a reason for your answer.

2)



PQ is parallel to *RS*.

OSQ and *ORP* are straight lines.

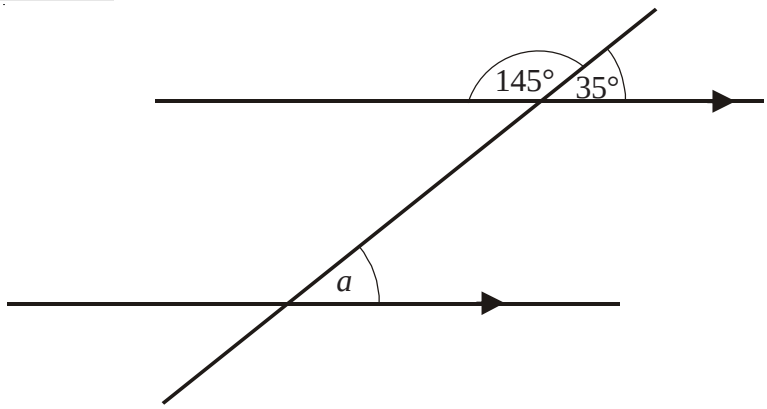
a) (i) Write down the value of *x*.

(ii) Give a reason for your answer.

b) Work out the value of *y*.

Parallel Lines

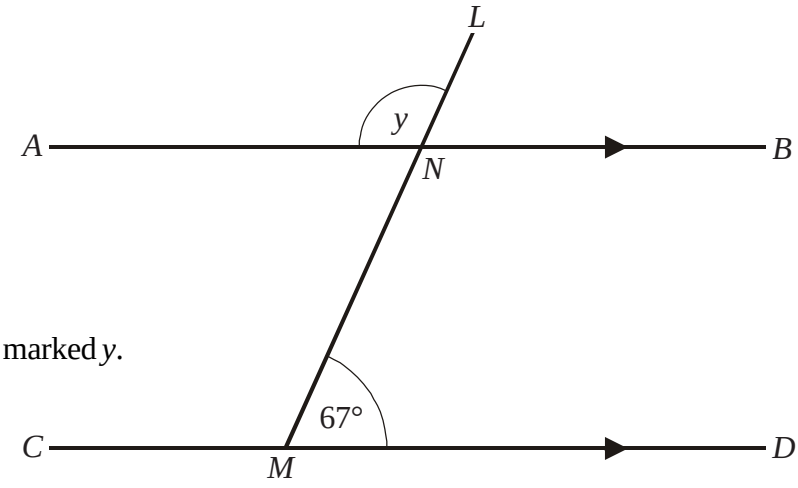
1)



(i) Write down the size of the angle marked *a*.

(ii) Give a reason for your answer.

2)

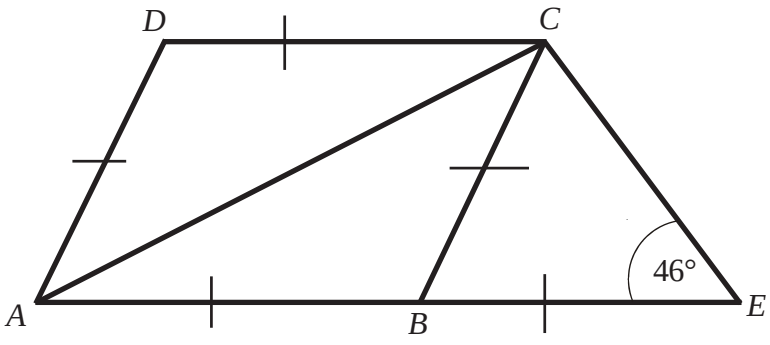


ANB is parallel to *CMD*.
LNM is a straight line.
Angle *LMD* = 67°

(i) Work out the size of the angle marked *y*.

(ii) Give reasons for your answer.

3)

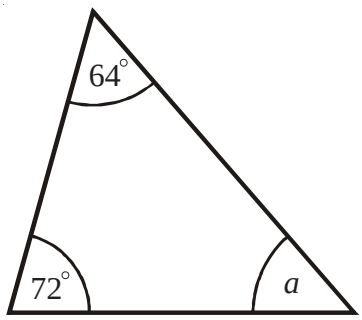


ABCD is a rhombus.
BCE is an isosceles triangle.
ABE is a straight line.

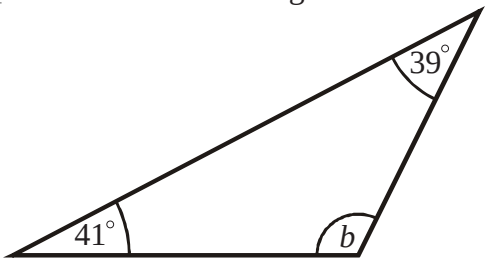
Work out the size of angle *DCA*.

Angle Sum of a Triangle

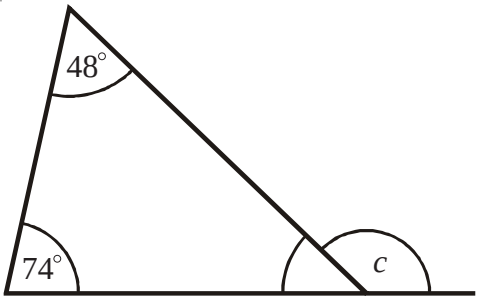
1) Work out the size of angle *a*.



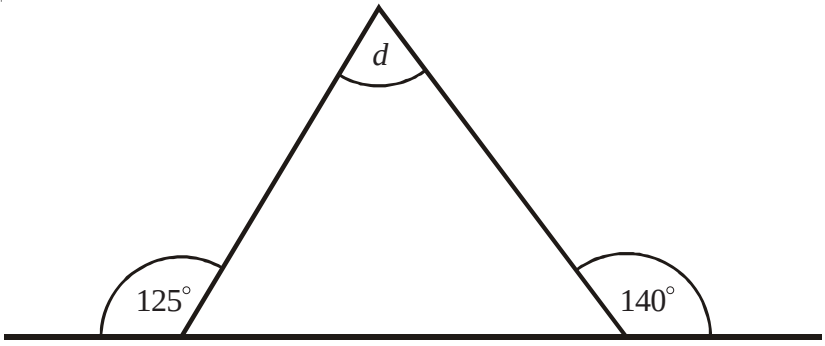
2) Work out the size of angle *b*.



3) Work out the size of angle *c*.



4) Work out the size of angle *d*.



Properties of Special Triangles

1) *ABC* is a triangle.

a) Find the size of angle *A*.

b) Triangle *ABC* is equilateral.
Explain why.

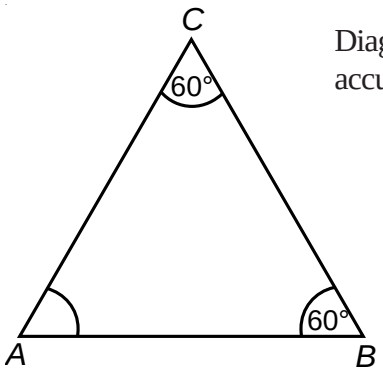


Diagram **NOT** accurately drawn

2) *BCD* is a triangle.
ABC is a straight line.
Angle *CBD* = 70°.
BD = *CD*.

a) (i) Work out the value of *x*.

(ii) Give a reason for your answer.

b) (i) Work out the value of *y*.

(ii) Give reasons for your answer.

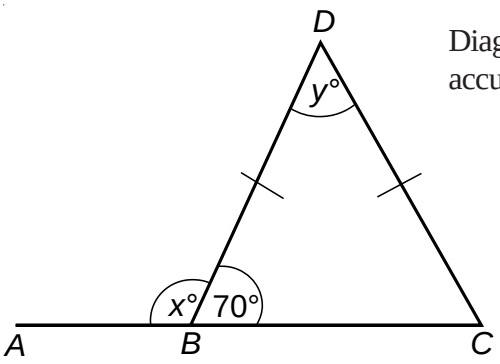


Diagram **NOT** accurately drawn

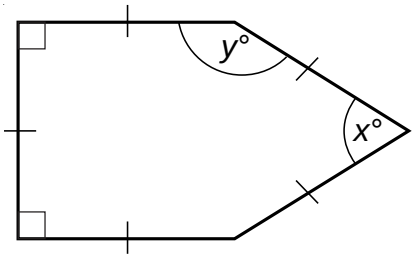
3) The diagram shows a 5-sided shape.
All the sides of the shape are equal in length.

a) (i) Find the value of *x*.

(ii) Give a reason for your answer.

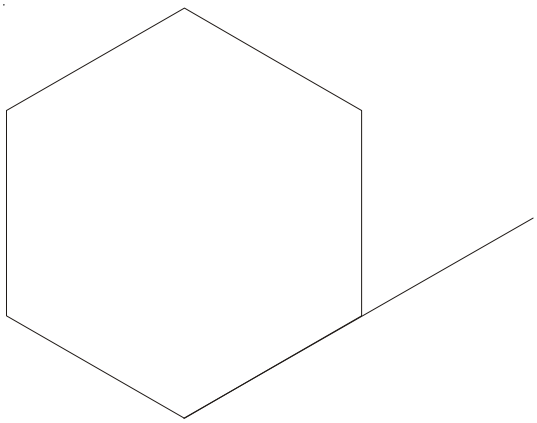
b) (i) Work out the value of *y*.

(ii) Explain your answer.



Angles of Regular Polygons

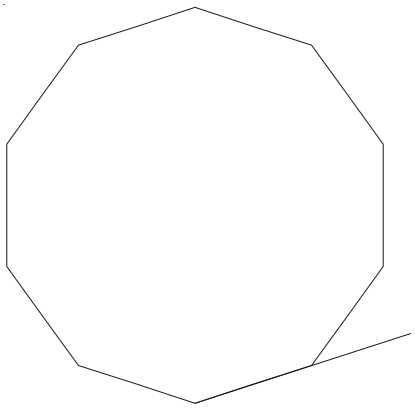
1)



a) Work out the size of an **exterior** angle of a regular hexagon.

b) Work out the size of an **interior** angle of a regular hexagon.

2)



a) Name the regular polygon, above.

b) Work out the size of an **exterior** angle and of an **interior** angle for this polygon.

3) The size of each **exterior** angle of a regular polygon is 90°.
Work out the number of sides of the regular polygon.

4) The size of each **exterior** angle of a regular polygon is 40°.
Work out the number of sides of the regular polygon.

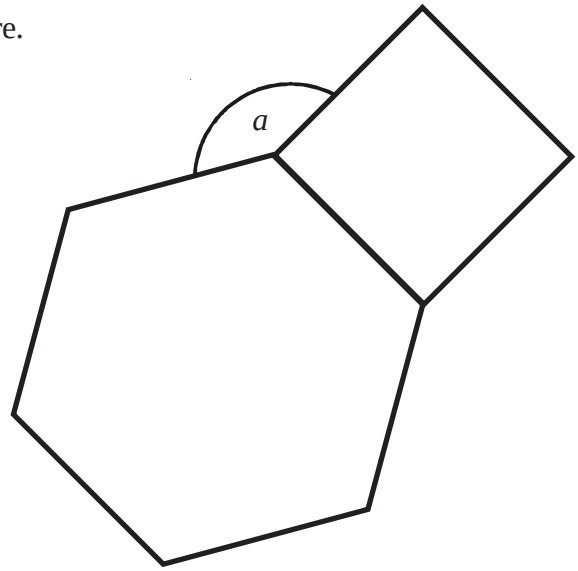
5) The size of each **interior** angle of a regular polygon is 120°.
Work out the number of sides of the regular polygon.

6) The size of each **interior** angle of a regular polygon is 150°.
Work out the number of sides of the regular polygon.

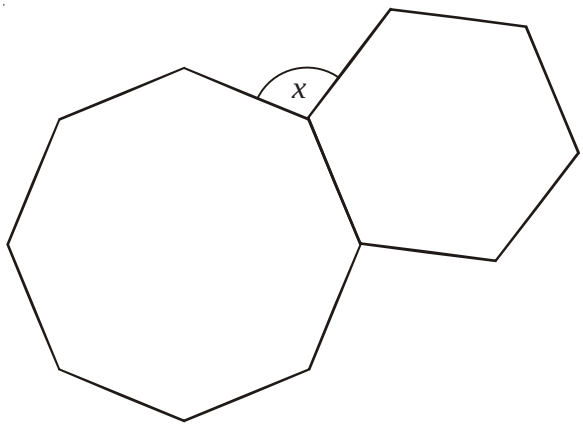
Angles of Regular Polygons

1) The diagram shows a regular hexagon and a square.

Calculate the size of the angle *a*.



2)

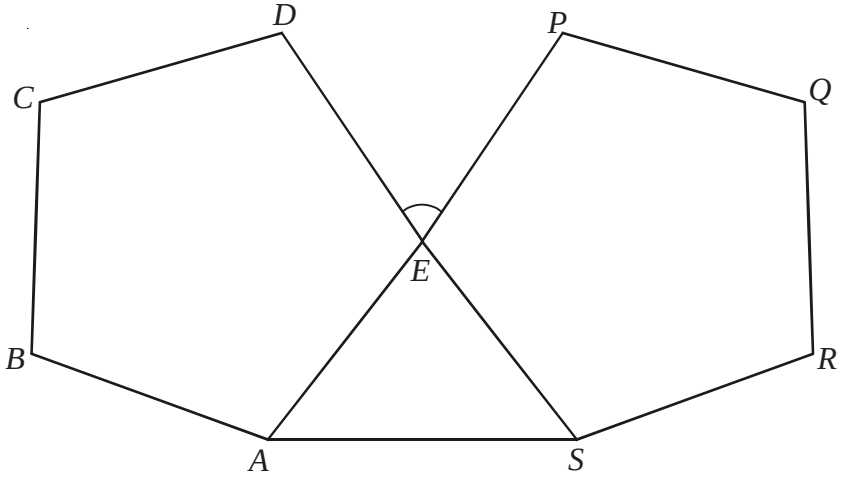


The diagram shows a regular octagon and a regular hexagon.

Work out the size of angle *x*.

3) *ABCDE* and *PQRSE* are regular pentagons.
AES is an equilateral triangle.

Work out the size of angle *DEP*.

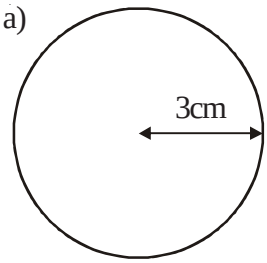


Area of Circles

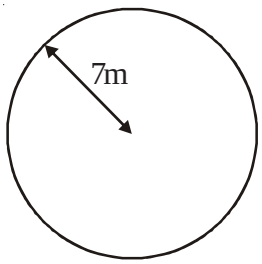
Take π to be 3.142 for all questions.

1) Find the areas of the following shapes.

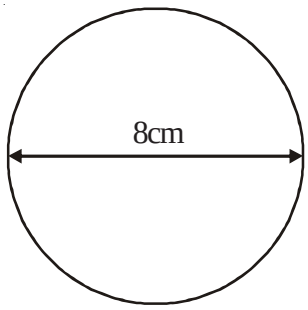
a)



b)

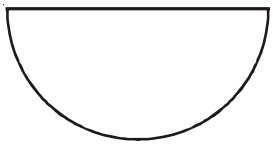


c)

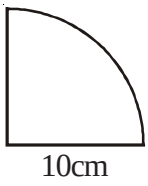


2) Work out the areas of the following shapes.

a)

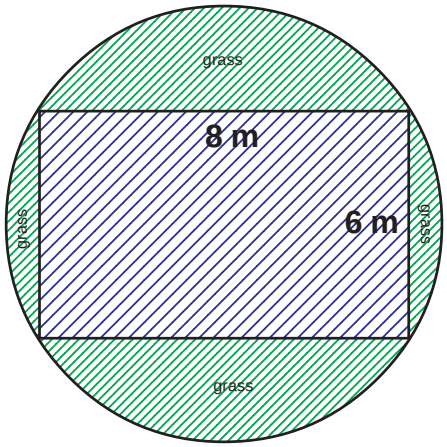


b)



3) The diagram shows a circular garden comprising a rectangular pond enclosed by grass.
The circular garden has a diameter of 10 m.
The rectangular pond measures 8 m by 6 m.

Work out the area of the garden covered in grass.
Give your answer to the nearest m^2.



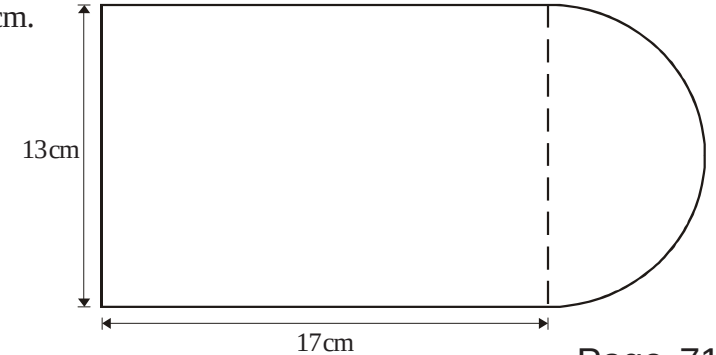
4) The **radius** of the top of a circular table is 60 cm.
The table also has a circular base with **diameter** 30 cm.

a) Work out the area of the top of the table.

b) Work out the area of the base of the table.

5) The diagram shows a shape, made from a semi-circle and a rectangle.
The diameter of the semi-circle is 13 cm.
The length of the rectangle is 17 cm.

Calculate the area of the shape.
Give your answer correct to 3 significant figures.

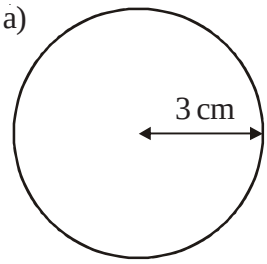


Circumference of Circles

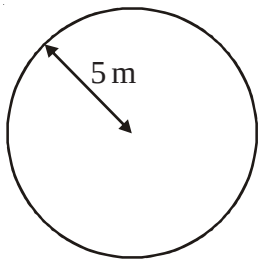
Take π to be 3.142 for all questions.

1) Find the circumference of the following shapes.

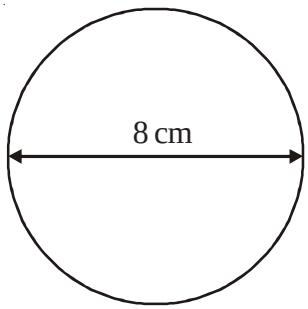
a)



b)

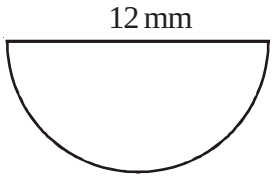


c)

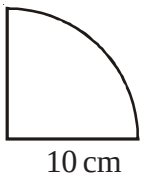


2) Work out the perimeter of the following shapes.

a)



b)



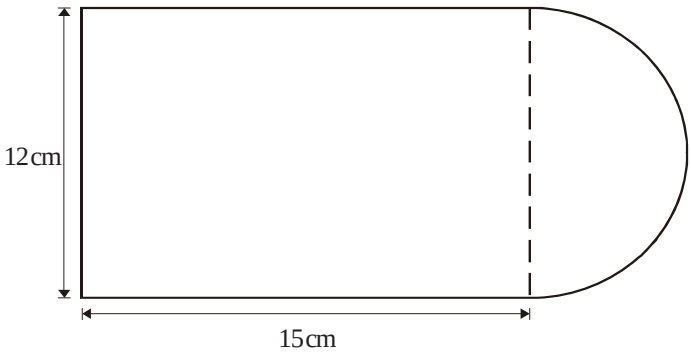
3) The **radius** of the top of a circular table is 60 cm.
The table also has a circular base with **diameter** 30 cm.

a) Work out the circumference of the top of the table.
Let π be 3.14

b) Work out the circumference of the base of the table.
Let π be 3.14

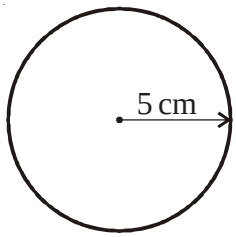
4) The diagram shows a shape, made from a semi-circle and a rectangle.
The diameter of the semi-circle is 12 cm.
The length of the rectangle is 15 cm.

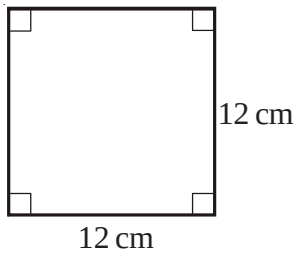
Calculate the perimeter of the shape.
Give your answer correct to
3 significant figures.



Area and Circumference of Circles

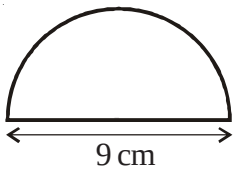
1) A circle has a radius of 5 cm.
A square has sides of length 12 cm.





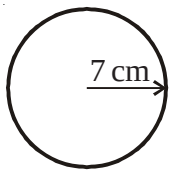
Work out the difference between the area of the circle and the area of the square if you take π to be 3.

2) Here is a tile in the shape of a semi-circle.



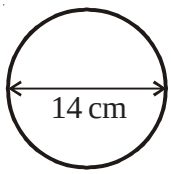
The diameter of the semi-circle is 9 cm.
Work out the perimeter of the tile.
Give your answer correct to two decimal places.

3) A circle has a radius of 7 cm.



Work out the area of the circle.
Give your answer correct to three significant figures.

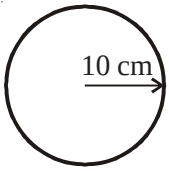
4) A circle has a diameter of 14 cm.



Work out the circumference of the circle.
Give your answer correct to three significant figures.

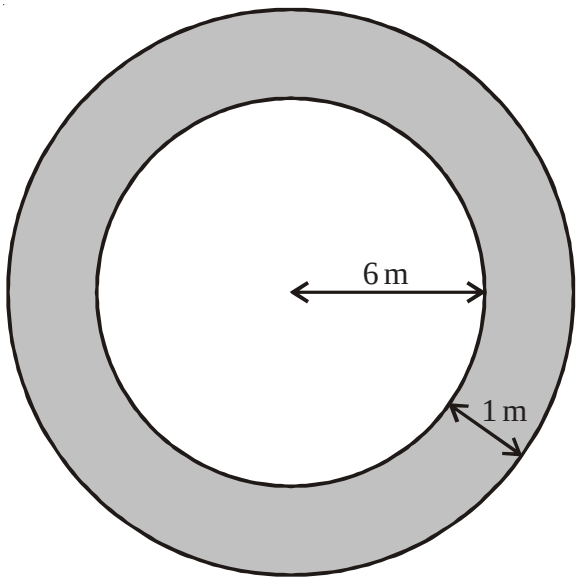
Area and Circumference of Circles

1) The radius of a circle is 10 cm.



Work out the area of this circle.
Take π to be 3.14

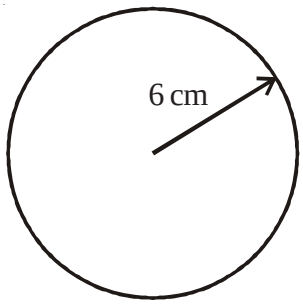
2) The diagram shows a circular pond with a path around it.



The pond has a radius of 6 m.
The path has a width of 1 m.

Work out the area of the path.
Give your answer correct to 3 significant figures.

3) The diagram shows a CD which has a radius of 6 cm.



a) Work out the circumference of the CD.
Give your answer correct to 3 significant figures.

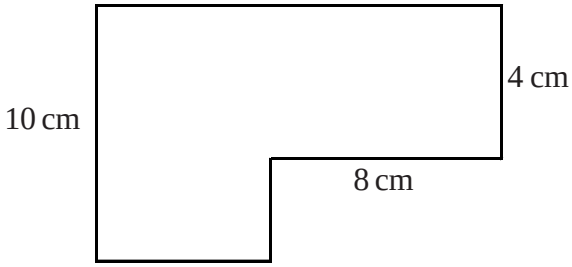
CDs of this size are cut from rectangular sheets of plastic.
Each sheet is 1 metre long and 50 cm wide.

b) Work out the greatest number of CDs which can be cut from one rectangular sheet.

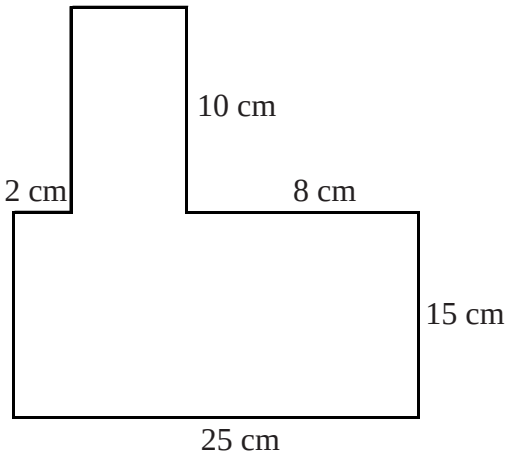
Area of Compound Shapes

1) Find the area of each shape.

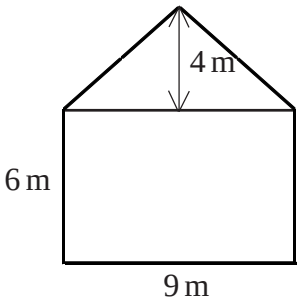
a)



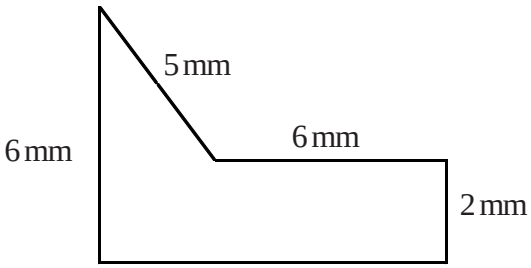
b)



c)

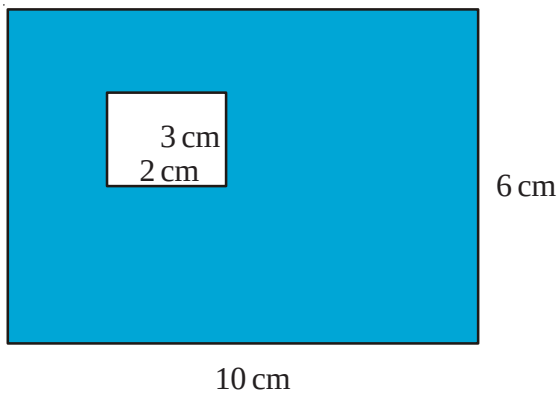


d)

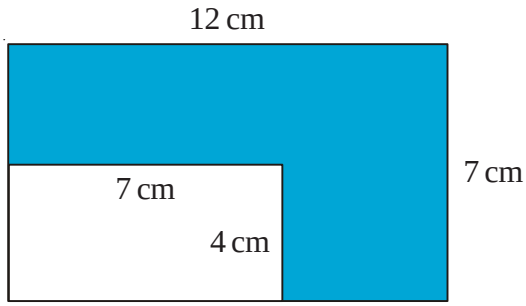


2) Find the shaded area of each shape.

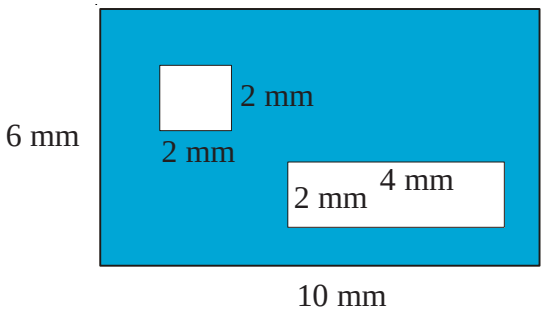
a)



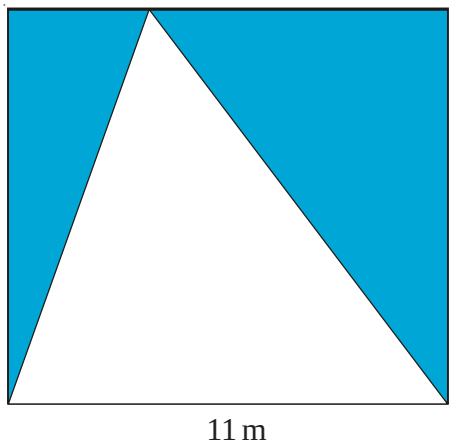
b)



c)

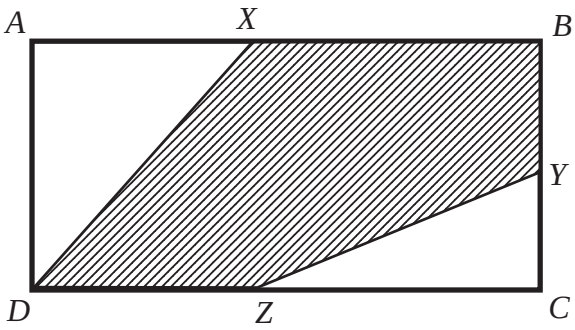


d)



Area of Compound Shapes

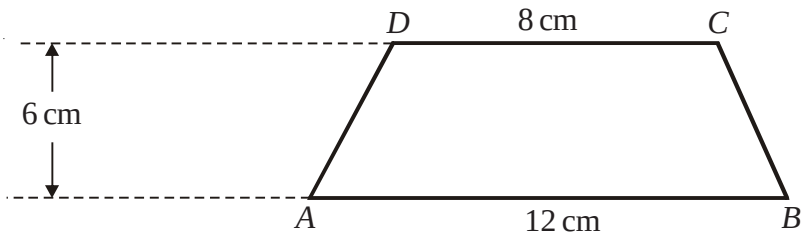
1)



ABCD is a rectangle.
X is the midpoint of *AB*.
Y is the midpoint of *BC*.
Z is the midpoint of *CD*.

What fraction of the total area of *ABCD* is shaded?
Show clearly how you get your answer.

2)



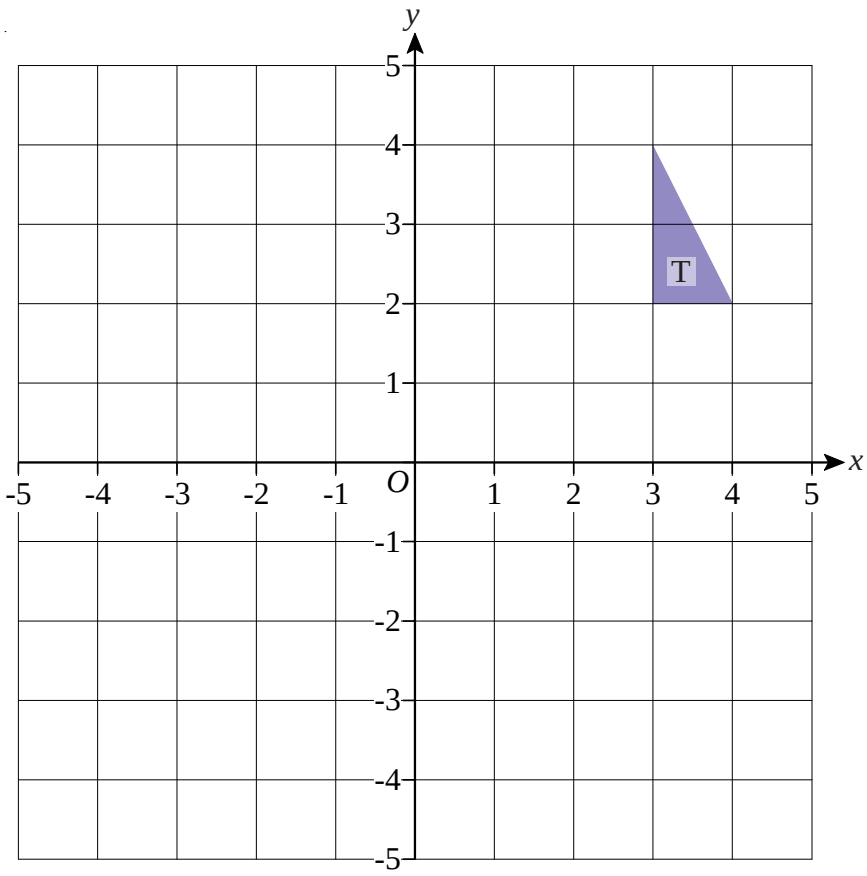
The diagram shows a trapezium *ABCD*.
The parallel sides of the trapezium are 8 cm and 12 cm.
The height of the trapezium is 6 cm.

Find the area of the trapezium *ABCD*.

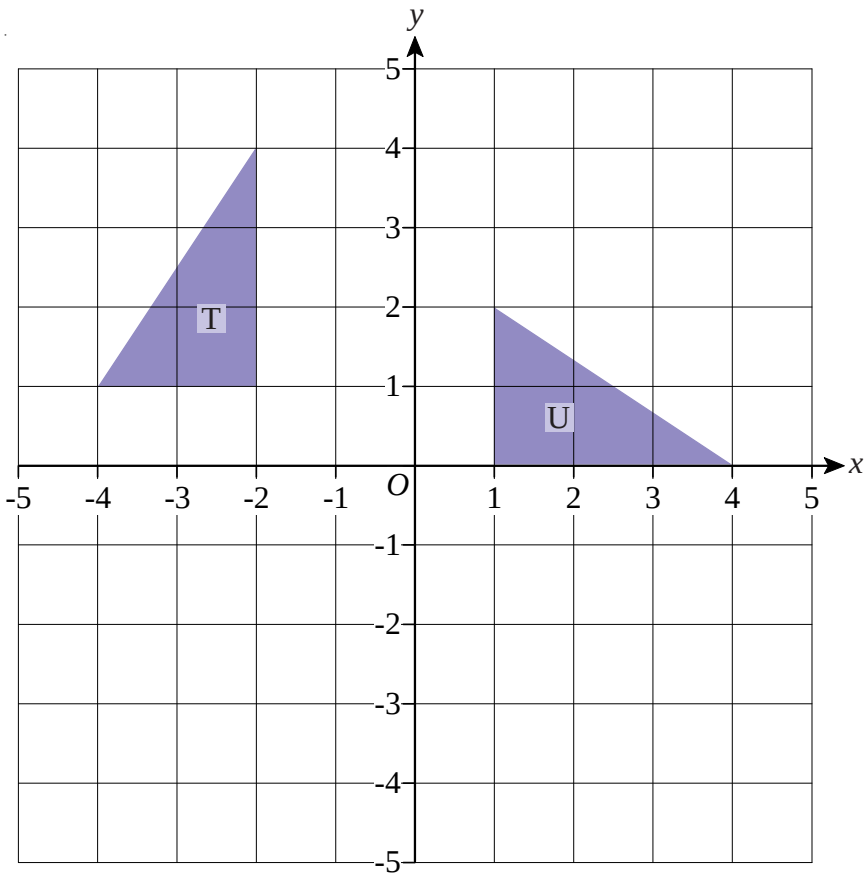
Rotations

1) a) Rotate triangle T 90° anti-clockwise about the point (0, 0).
Label your new triangle U.

b) Rotate triangle T 180° about the point (2, 0).
Label your new triangle V.



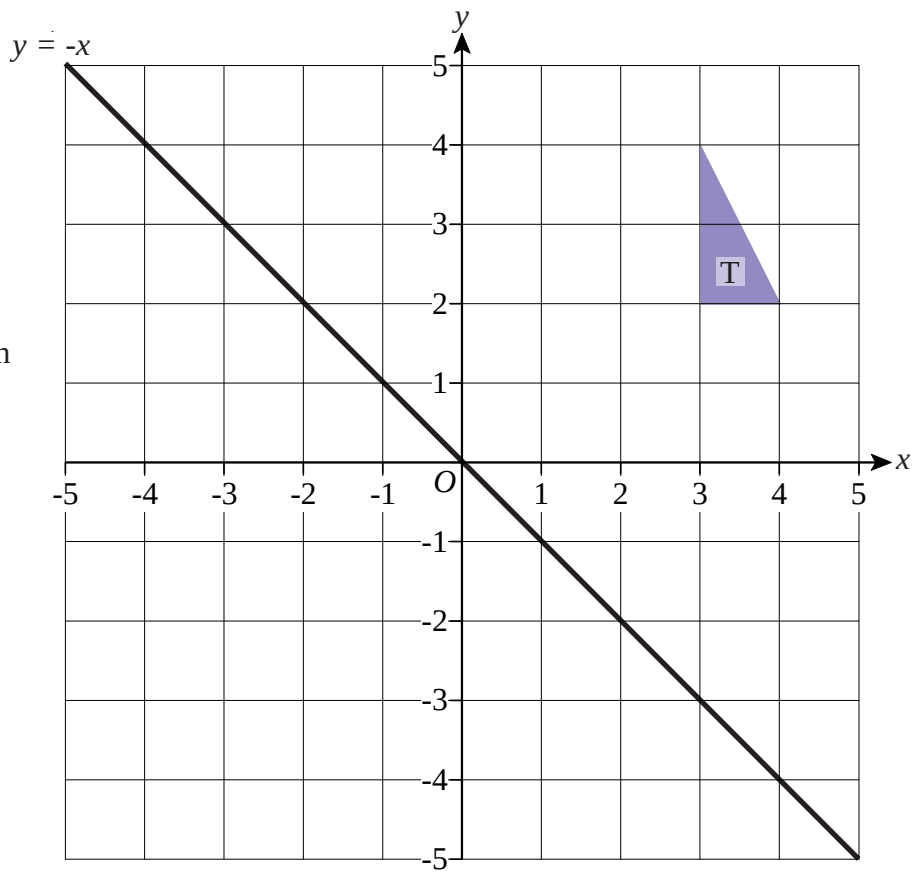
2) Describe fully the single transformation which maps triangle T to triangle U.



Reflections

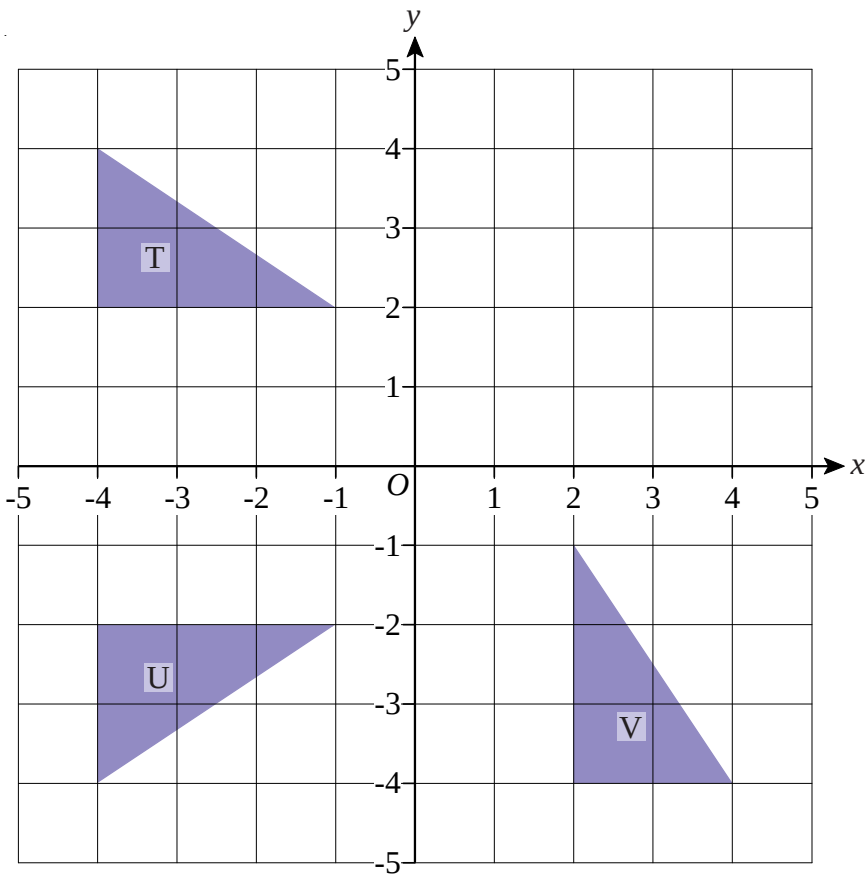
1) a) Reflect triangle T in the *x* axis.
Label your new triangle U.

b) Reflect triangle T in the line with equation $y = -x$.
Label your new triangle V.



2) a) Describe fully the single transformation which maps triangle T to triangle U.

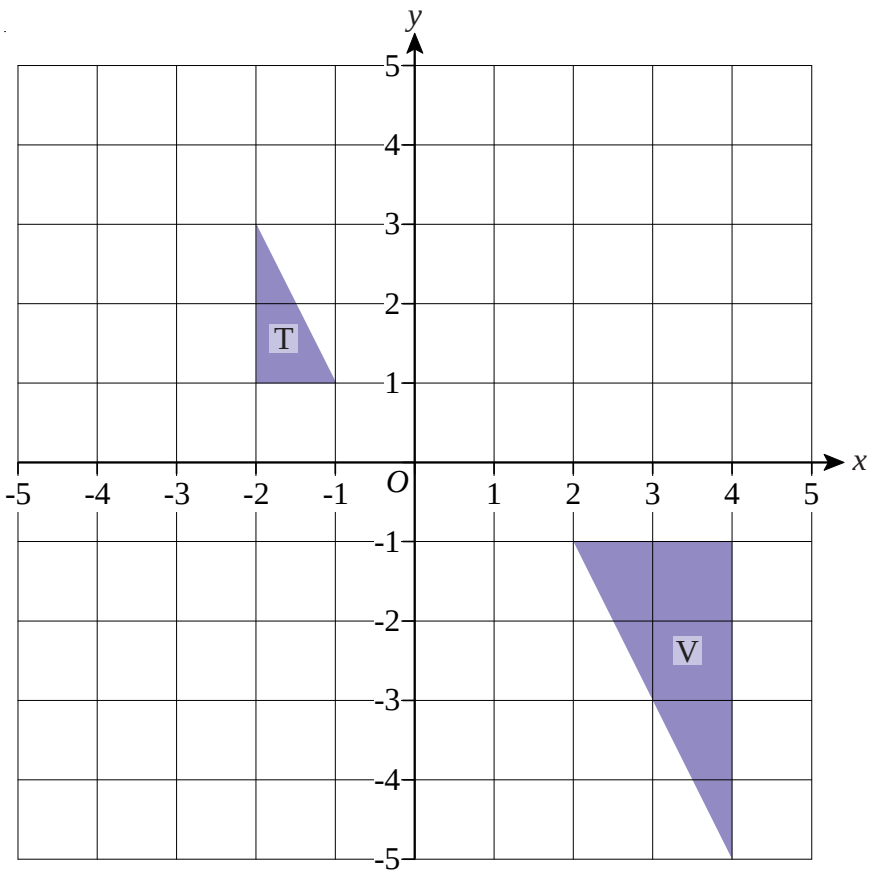
b) Describe fully the single transformation which maps triangle T to triangle V.



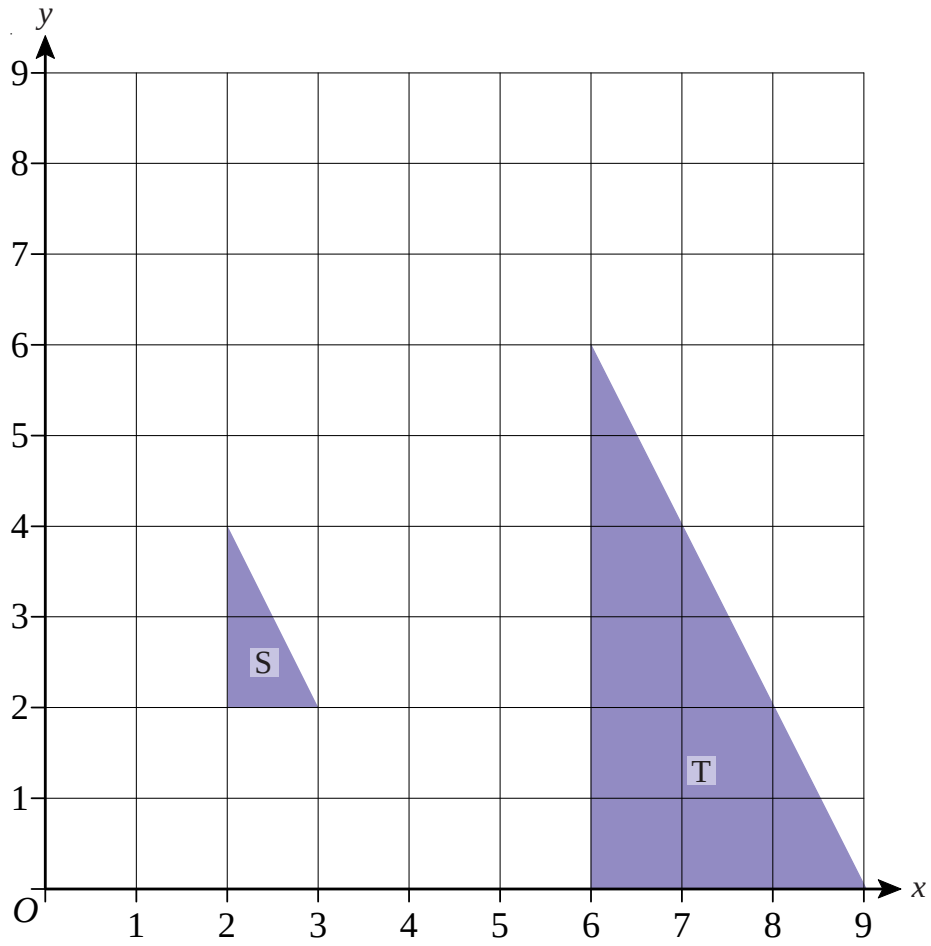
Enlargements

1) a) Enlarge triangle T by scale factor 2 using point (-5, 2) as the centre of enlargement.
Label your new triangle U.

b) Enlarge triangle V by scale factor a half using the point (-2, -3) as the centre of enlargement.
Label your new triangle W.



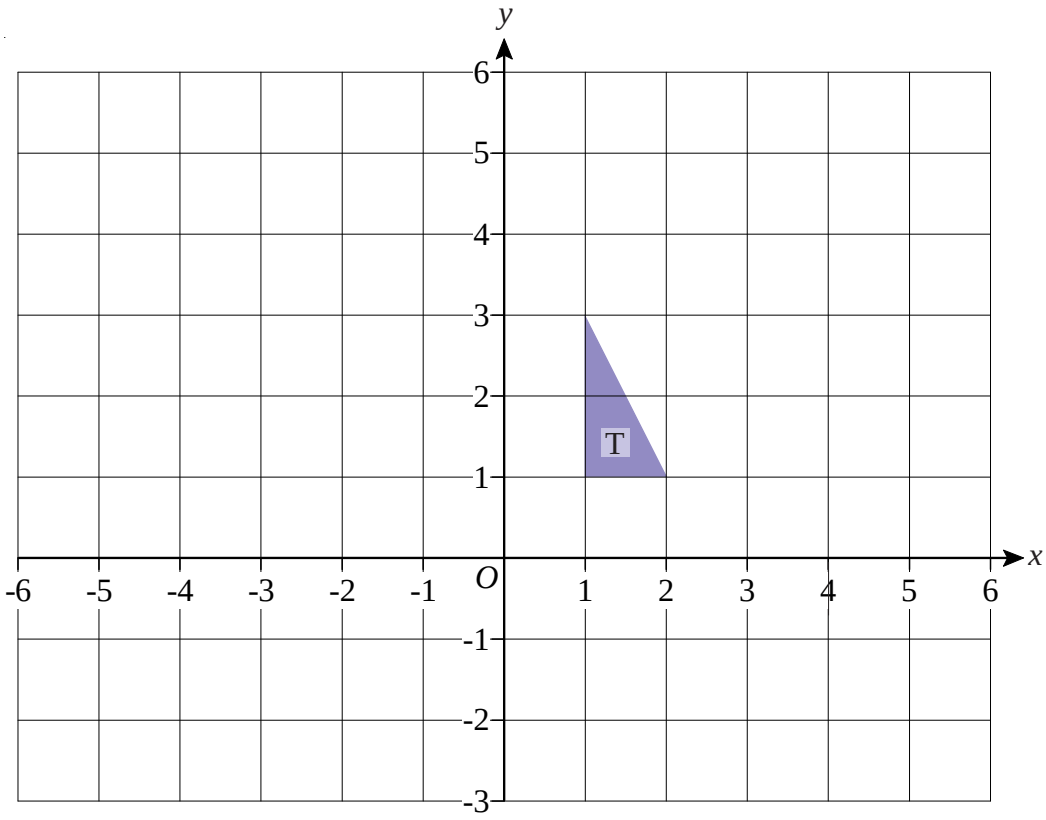
2) Describe fully the single transformation which maps triangle S to triangle T.



Translations

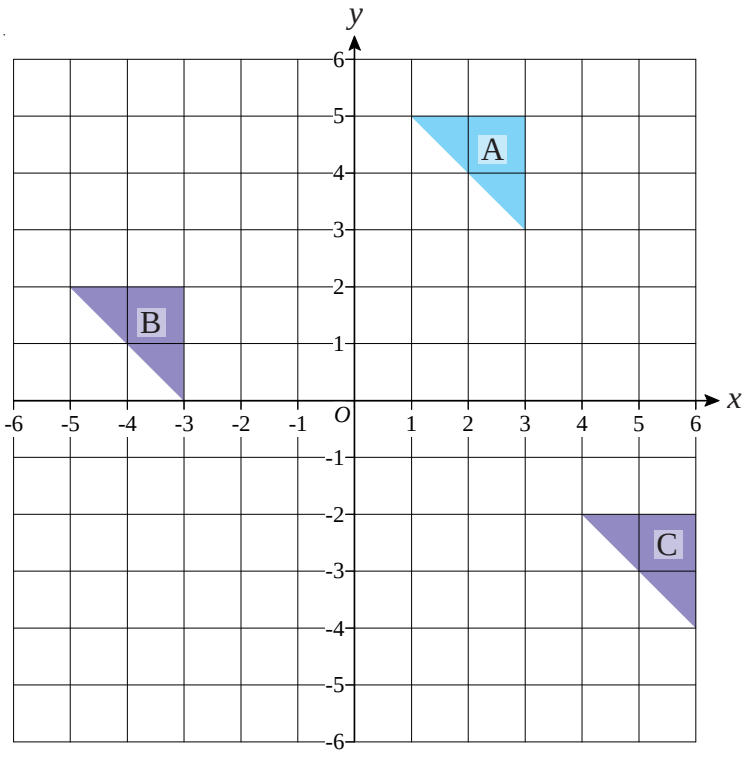
1) a) Translate triangle T by vector $\begin{bmatrix} -4 \\ 2 \end{bmatrix}$ and label it U.

b) Translate triangle T by vector $\begin{bmatrix} 3 \\ -2 \end{bmatrix}$ and label it V.



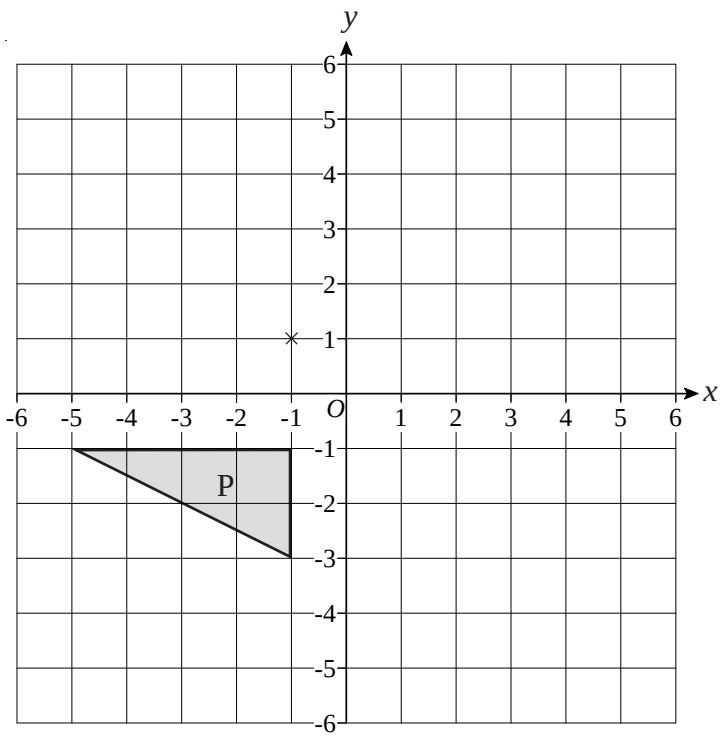
2) a) Describe fully the single transformation which maps triangle A to triangle B.

b) Describe fully the single transformation which maps triangle A to triangle C.



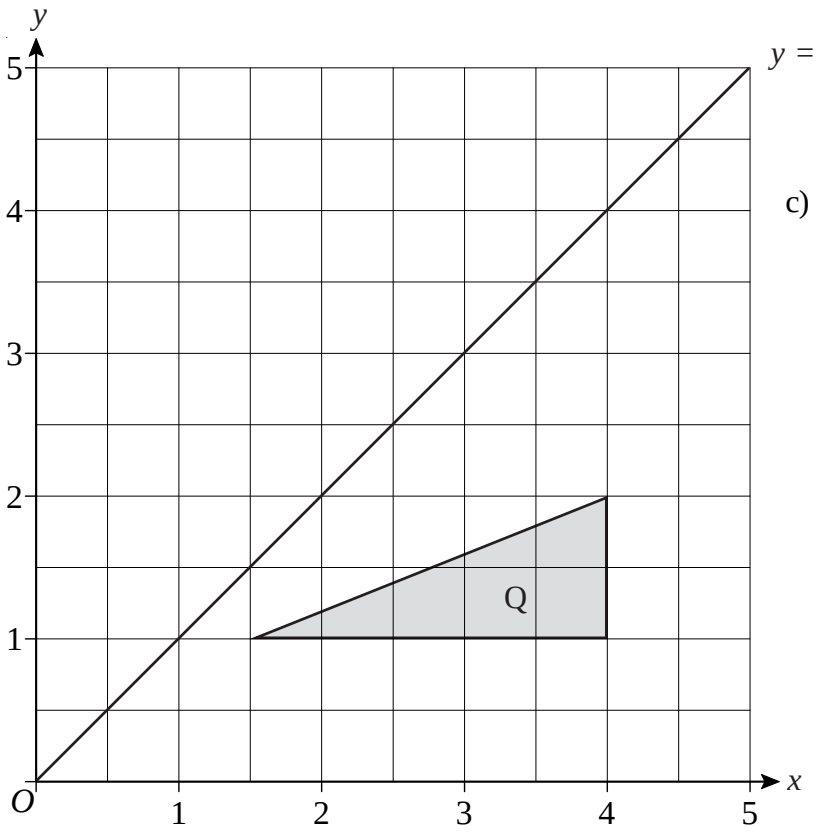
Transformations

1)



a) Rotate triangle P 180° about the point (-1, 1).
Label the new triangle A.

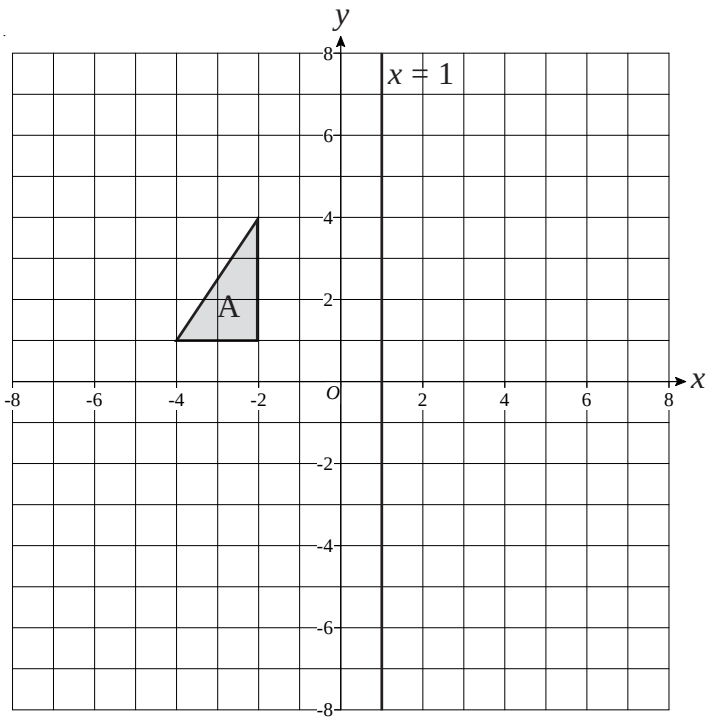
b) Translate triangle P by the vector $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$
Label the new triangle B.



c) Reflect triangle Q in the line $y = x$.
Label the new triangle C.

Transformations

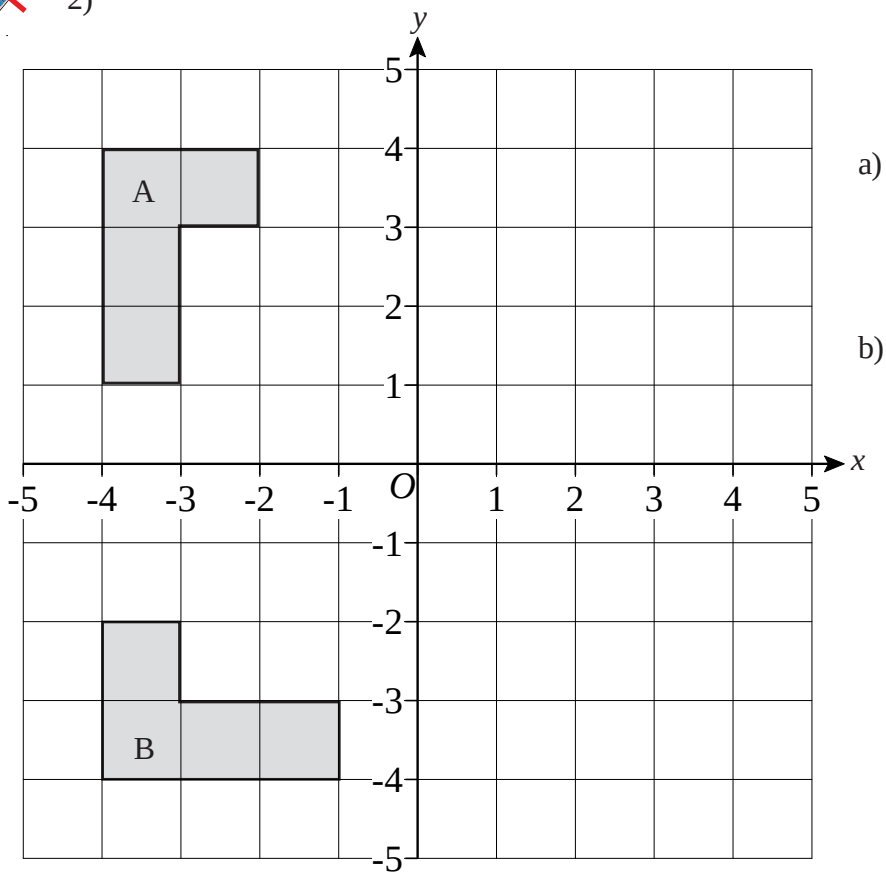
1)



Triangle A is reflected in the x-axis to give triangle B.
Triangle B is reflected in the line $x = 1$ to give triangle C.

Describe fully the **single** transformation that takes triangle A to triangle C.

2)

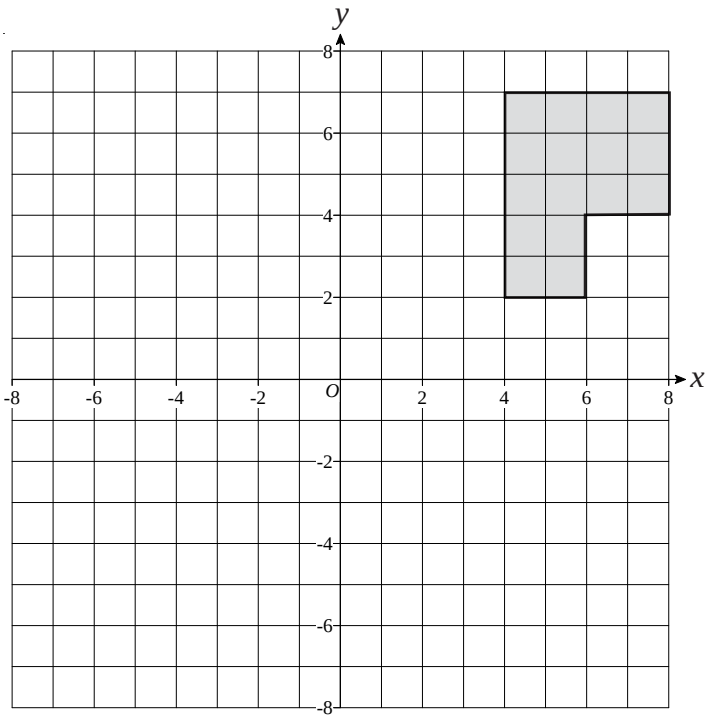


a) Reflect shape A in the y-axis.

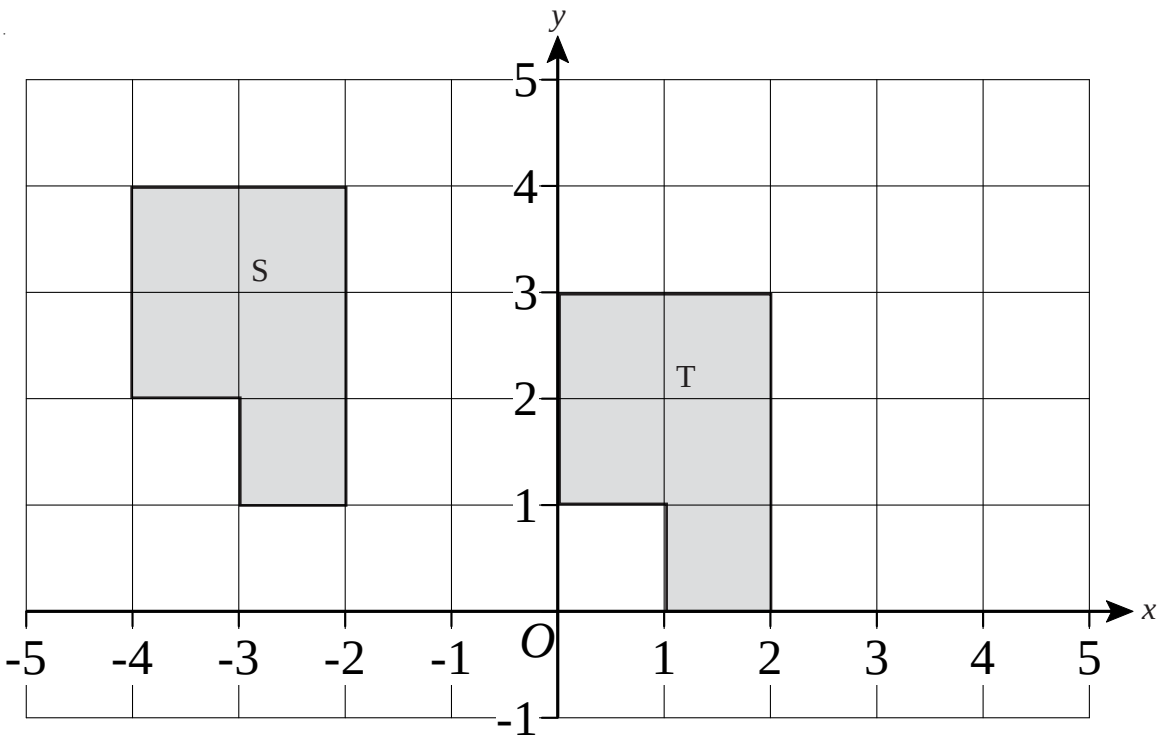
b) Describe fully the **single** transformation which takes shape A to shape B.

Transformations

1)



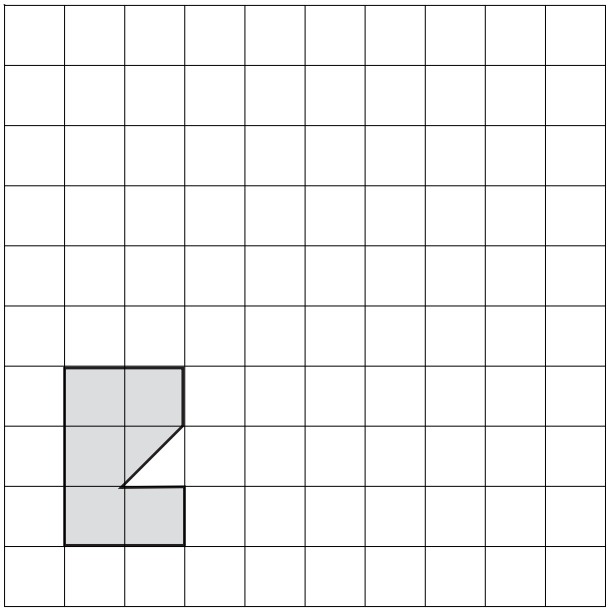
a) Rotate the shaded shape 90° clockwise about the point *0*.



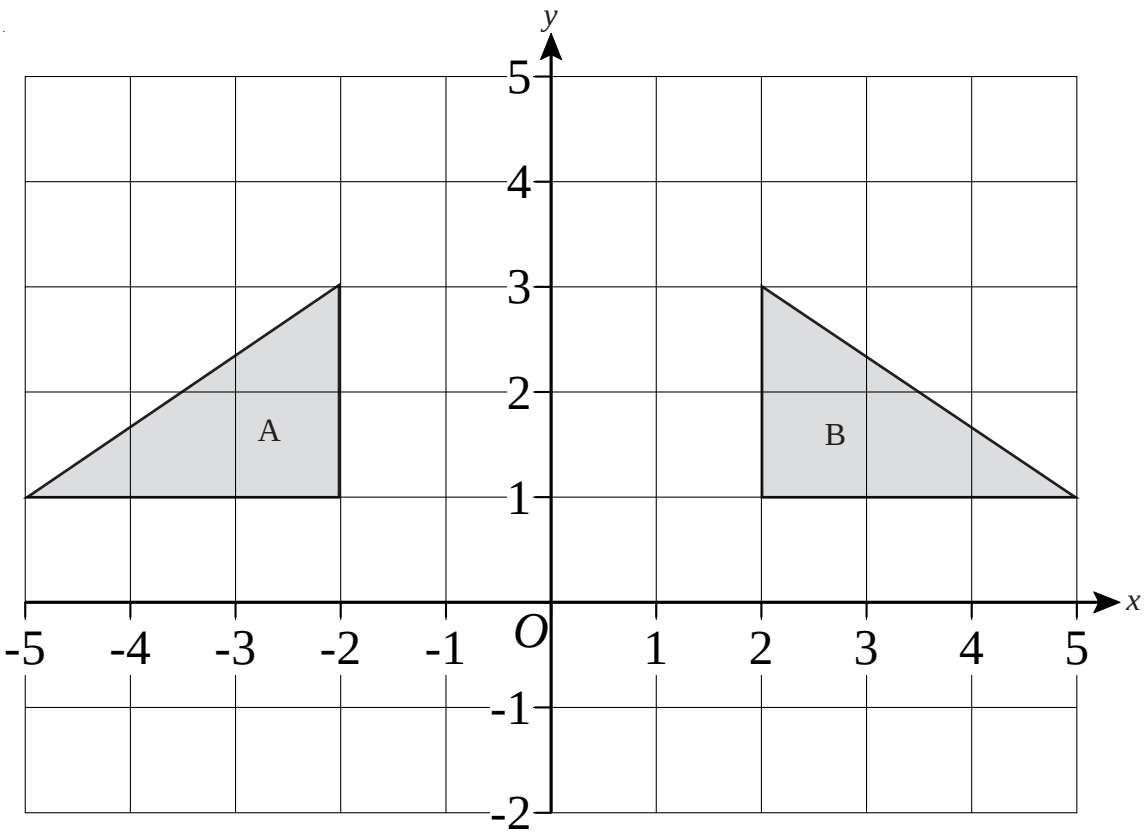
b) Describe fully the single transformation that will map shape S onto shape T.

Transformations

1)



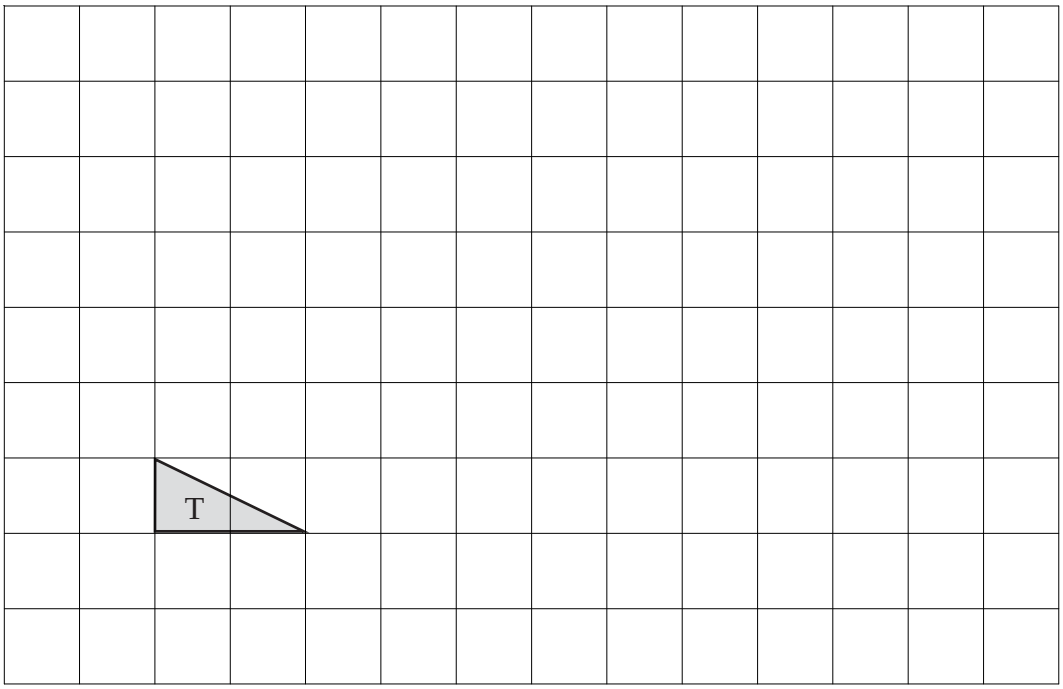
a) On the grid, draw an enlargement, scale factor 2, of the shaded shape.



b) Describe fully the single transformation that maps triangle A onto triangle B.

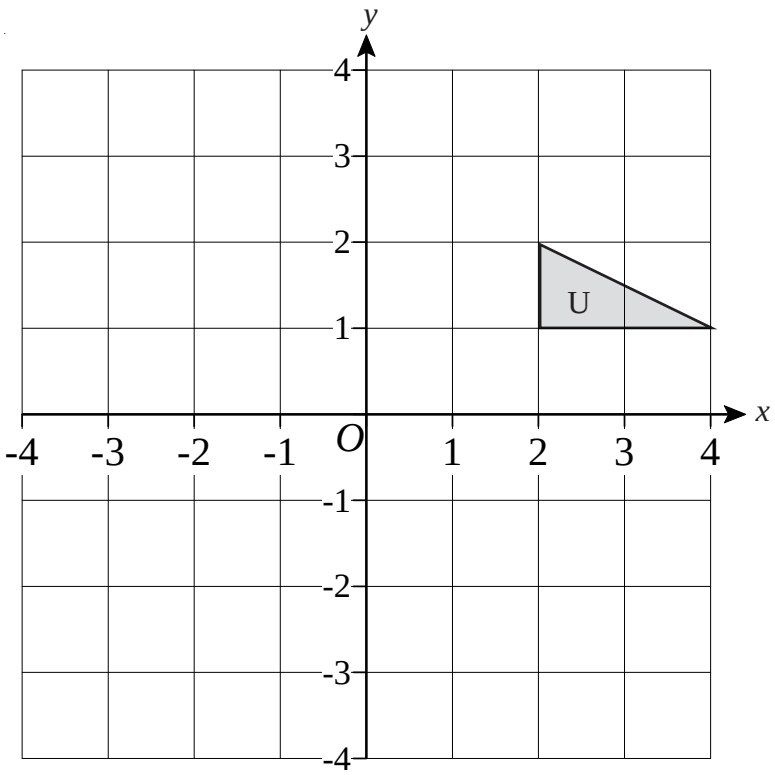
Transformations

1)



Triangle T has been drawn on a grid.

a) On the grid, draw an enlargement of the triangle T with scale factor 3.

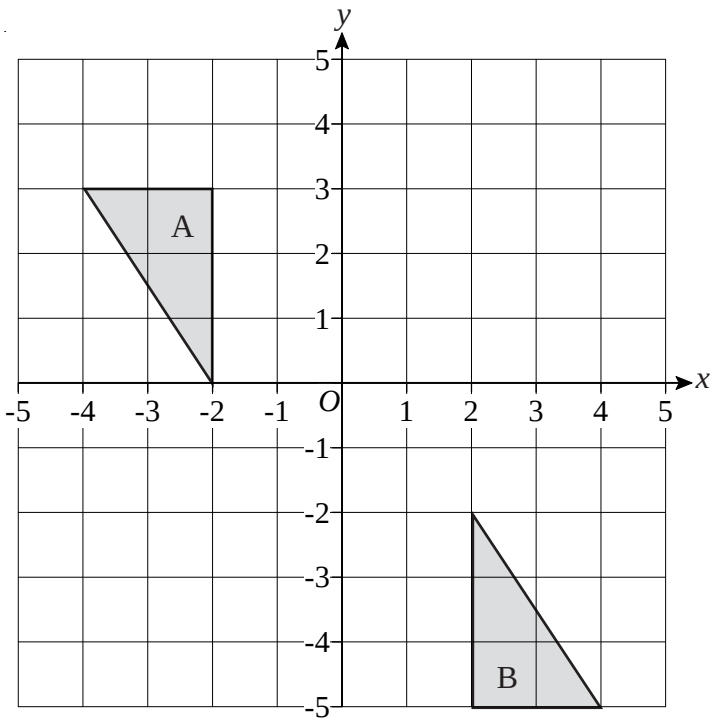


Triangle U has been drawn on a grid.

b) On the grid, rotate triangle U 90° clockwise about the centre *O*.

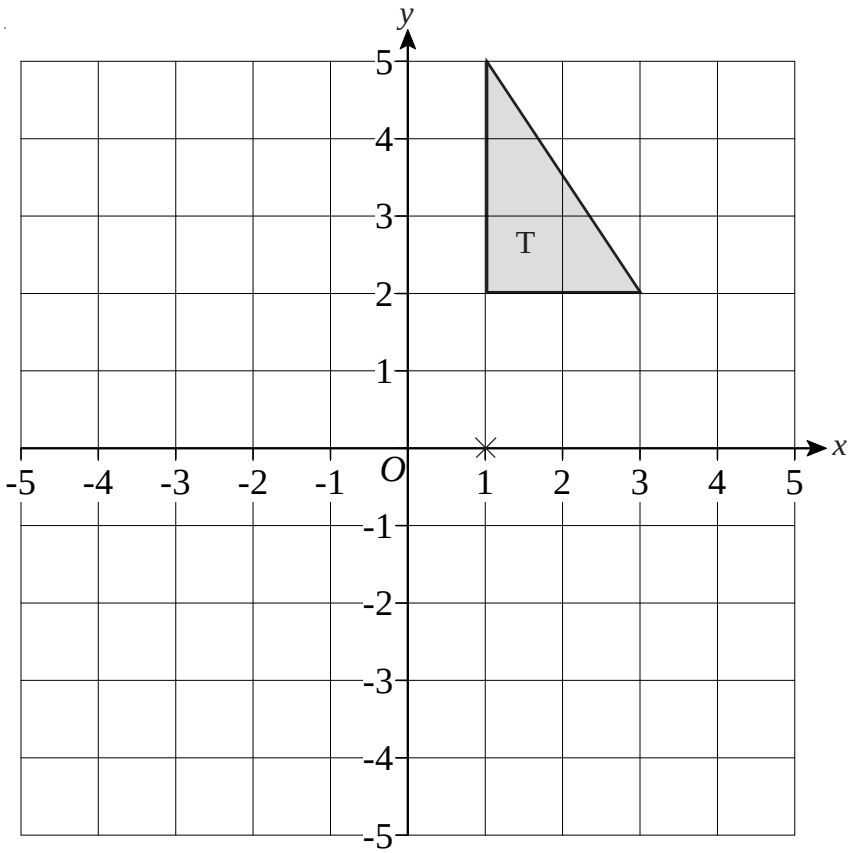
Transformations

1)



Describe fully the single transformation that maps triangle A onto triangle B.

2)



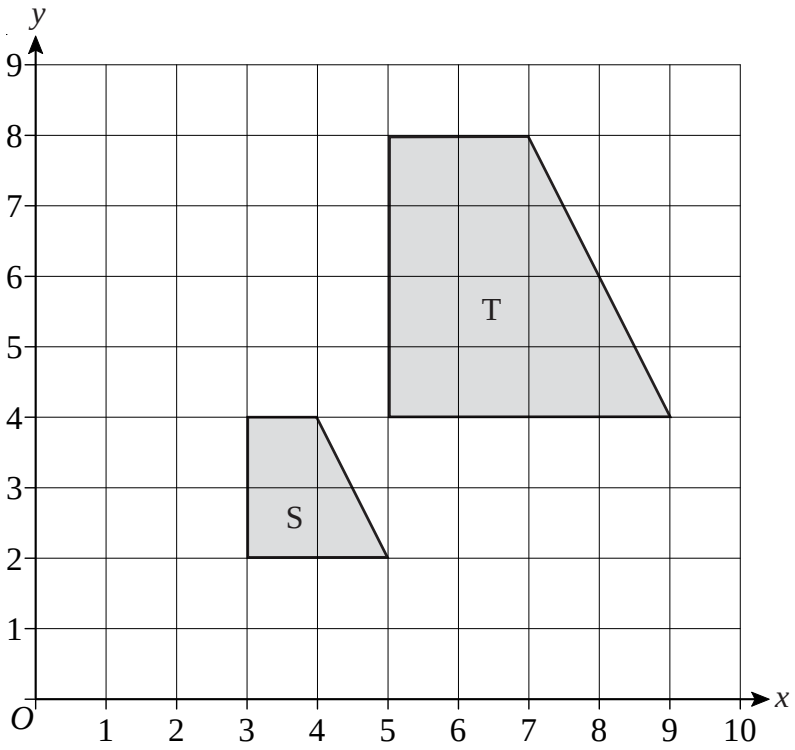
Triangle T has been drawn on the grid.

Rotate triangle T 180° about the point (1, 0)

Label the new triangle A.

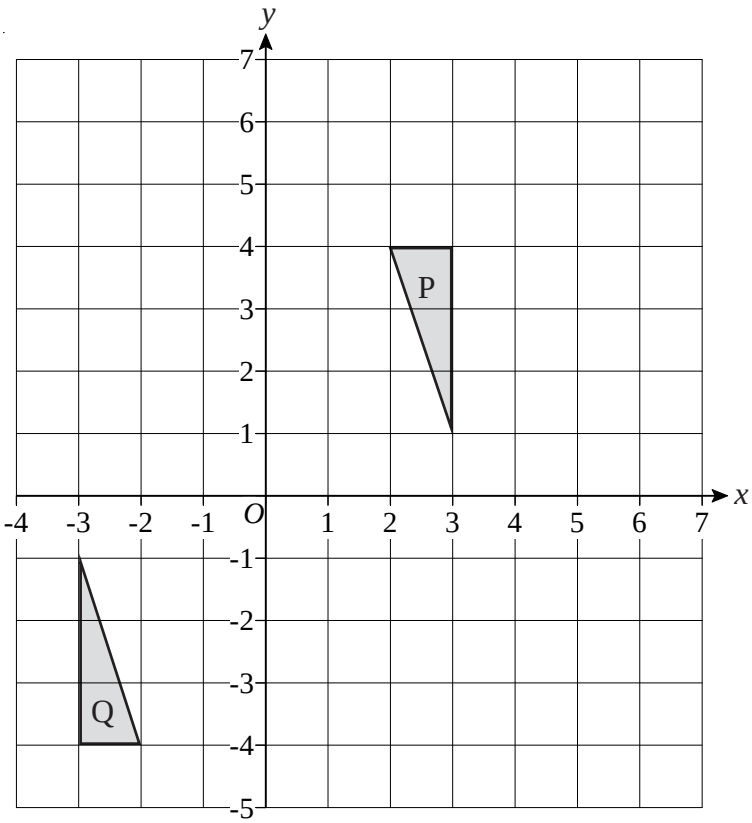
Transformations

1)



Describe fully the single transformation which maps shape S onto shape T.

2)



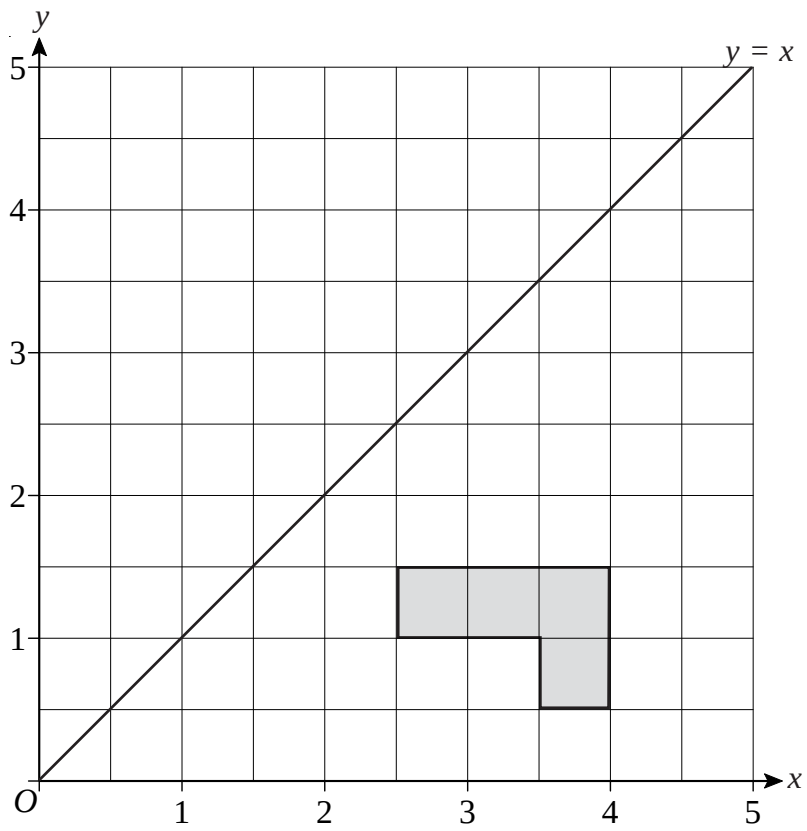
Triangle P and triangle Q are drawn on the grid.

a) Describe fully the single transformation which maps triangle P onto triangle Q.

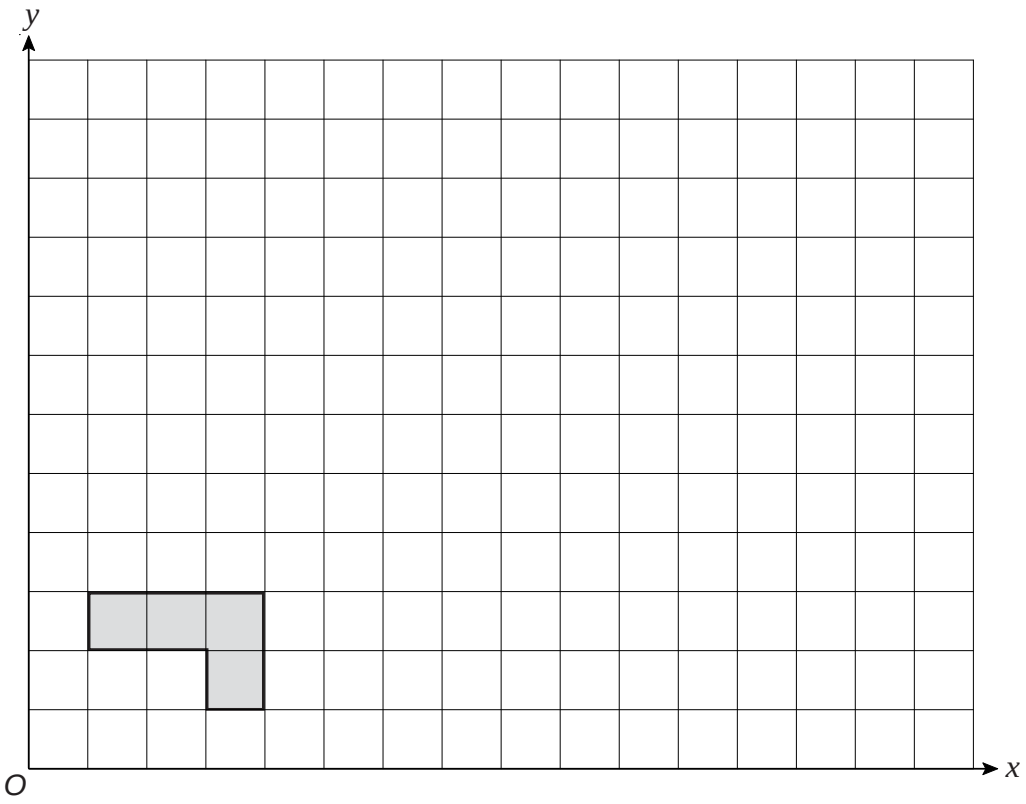
b) Translate triangle P by the vector $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$
Label the new triangle R.

Transformations

1)



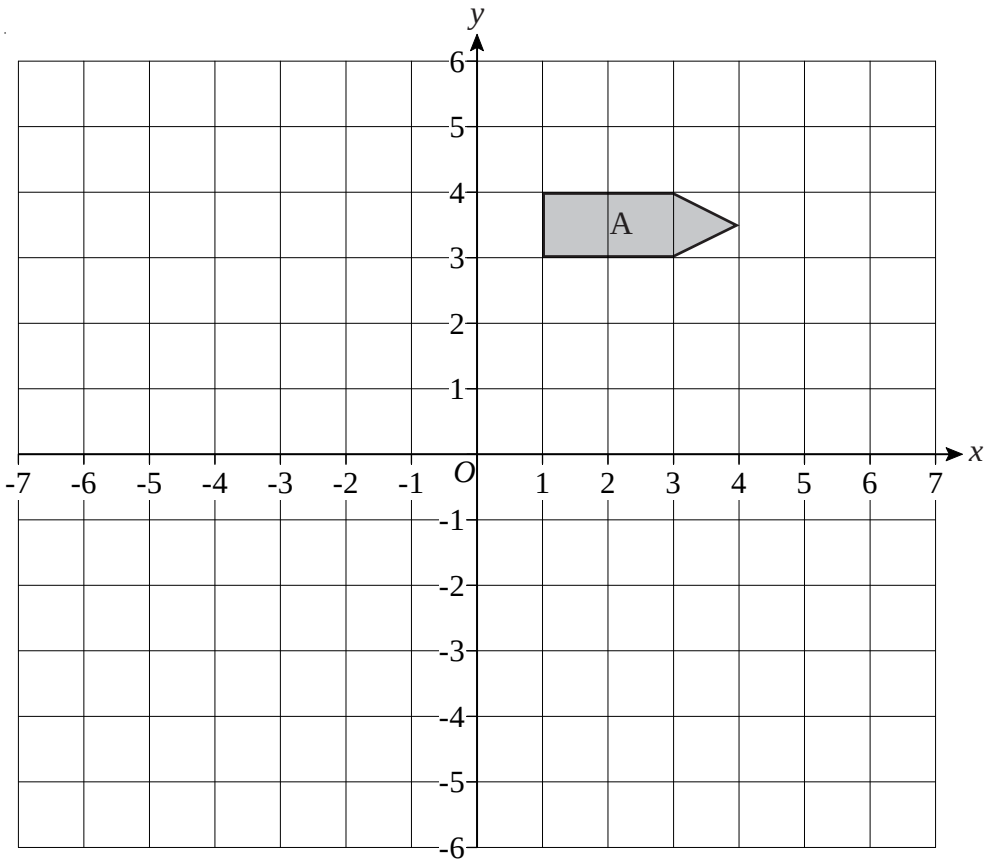
a) Reflect the shaded shape in the line $y = x$.



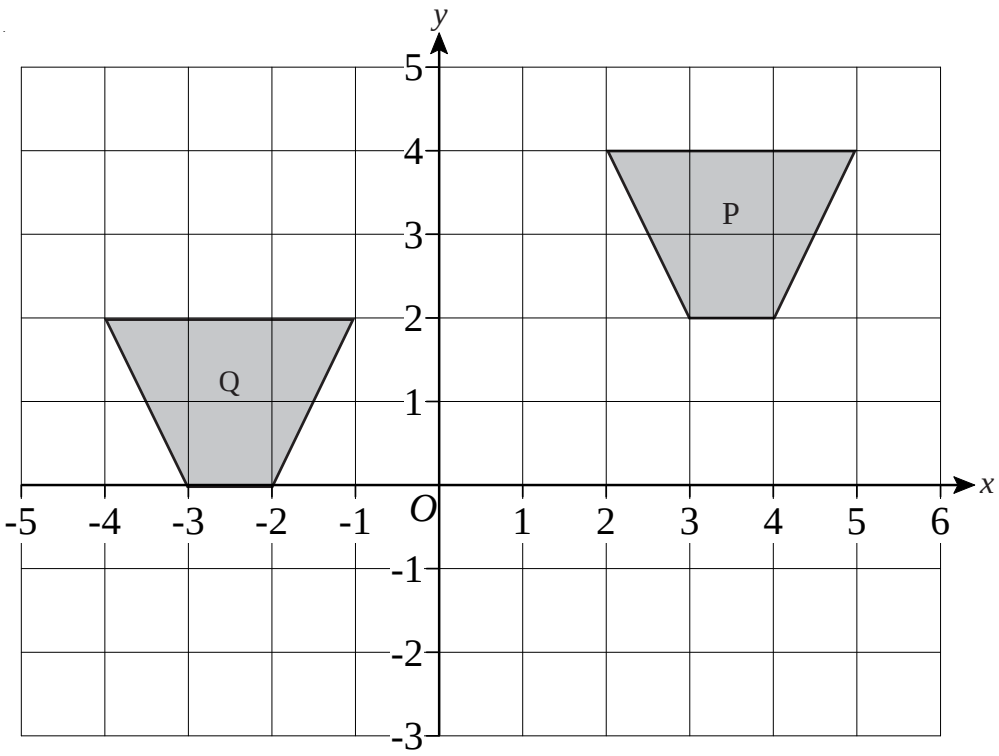
b) On the grid, enlarge the shaded shape by a scale factor of 3, centre O.

Transformations

1)



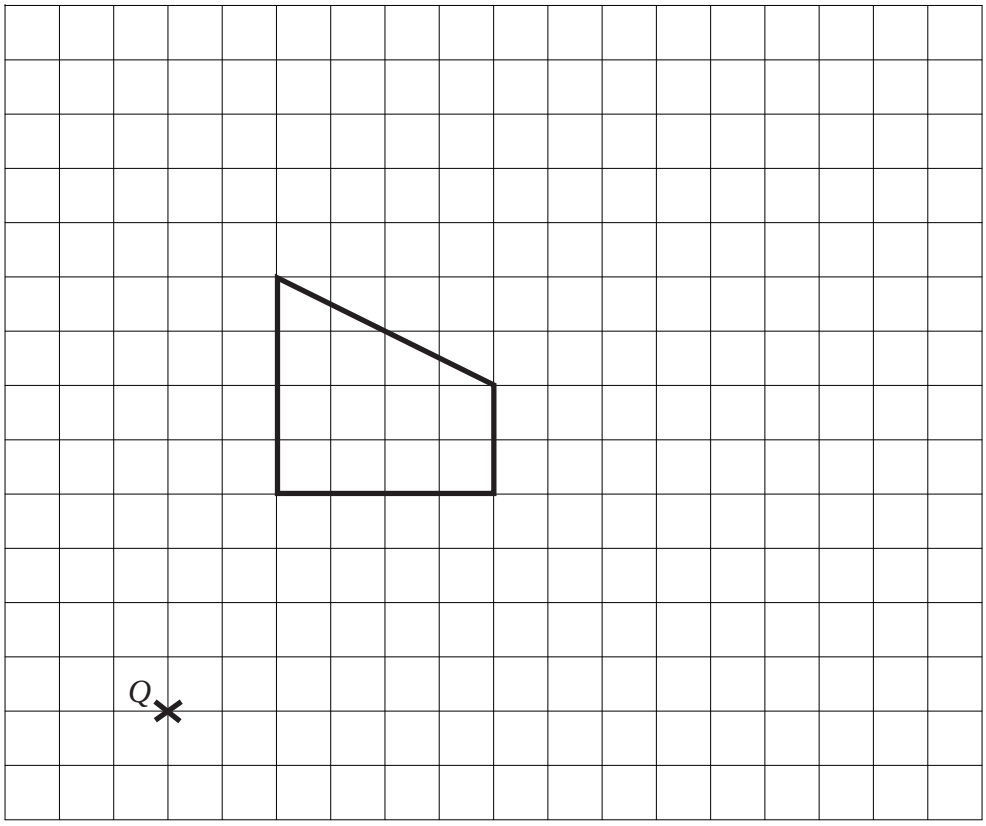
a) On the grid above, reflect shape A in the line $x = -1$



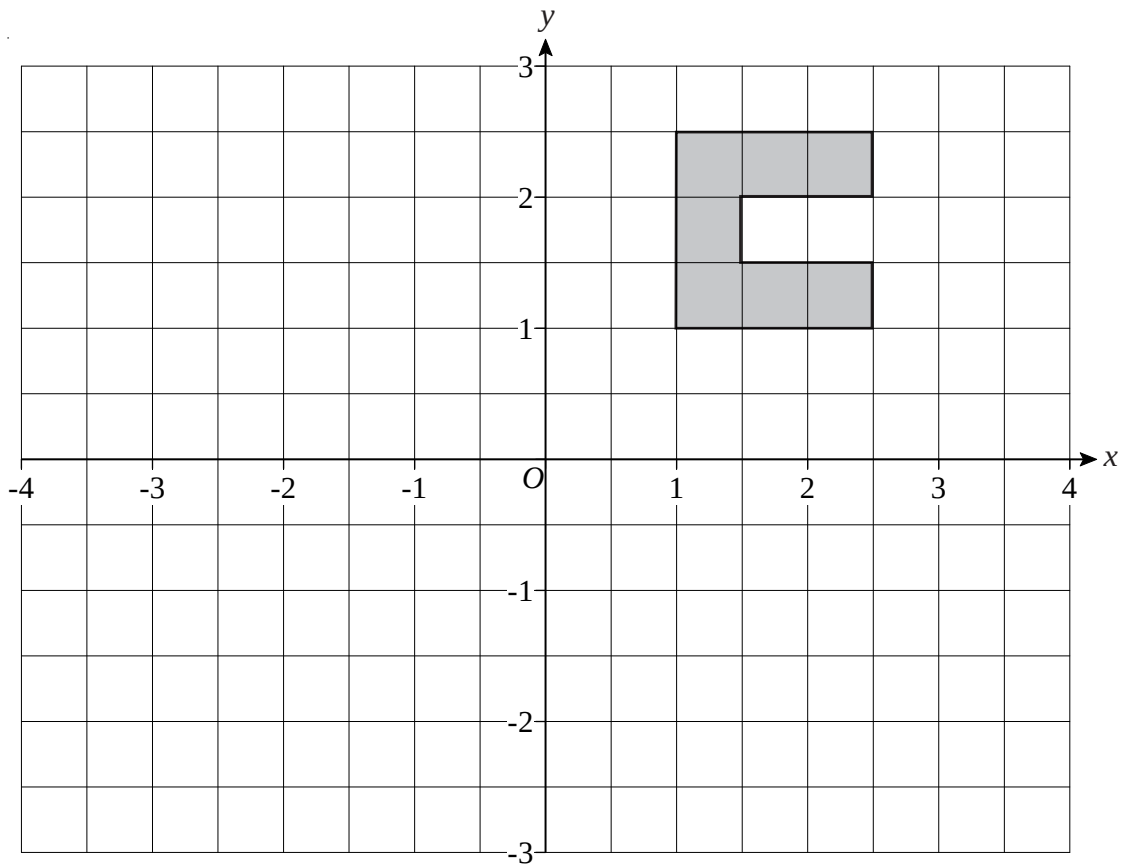
b) Describe fully the single transformation that will map shape P onto shape Q.

Transformations

1)



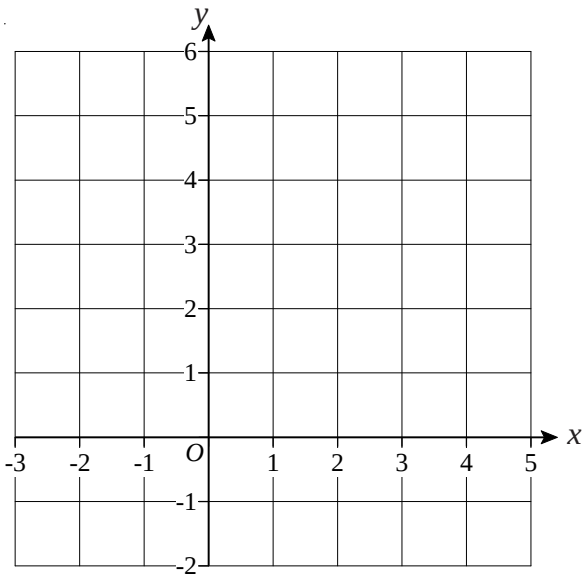
a) On the grid, enlarge the shape with scale factor $\frac{1}{2}$, centre Q.



b) Rotate the shape 90° clockwise, centre O.

Finding the Midpoint of a Line

1) Find the midpoint of *A* and *B* where *A* has coordinates (-2, 5) and *B* has coordinates (4, -1).



2) Find the midpoint of *A* and *B* where *A* has coordinates (2, 0) and *B* has coordinates (8, 6).

3) Find the midpoint of *A* and *B* where *A* has coordinates (-4, -2) and *B* has coordinates (2, 4).

4) Find the midpoint of *A* and *B* where *A* has coordinates (-3, -2) and *B* has coordinates (7, 5).

5) Find the midpoint of *A* and *B* where *A* has coordinates (2, -5) and *B* has coordinates (7, 4).

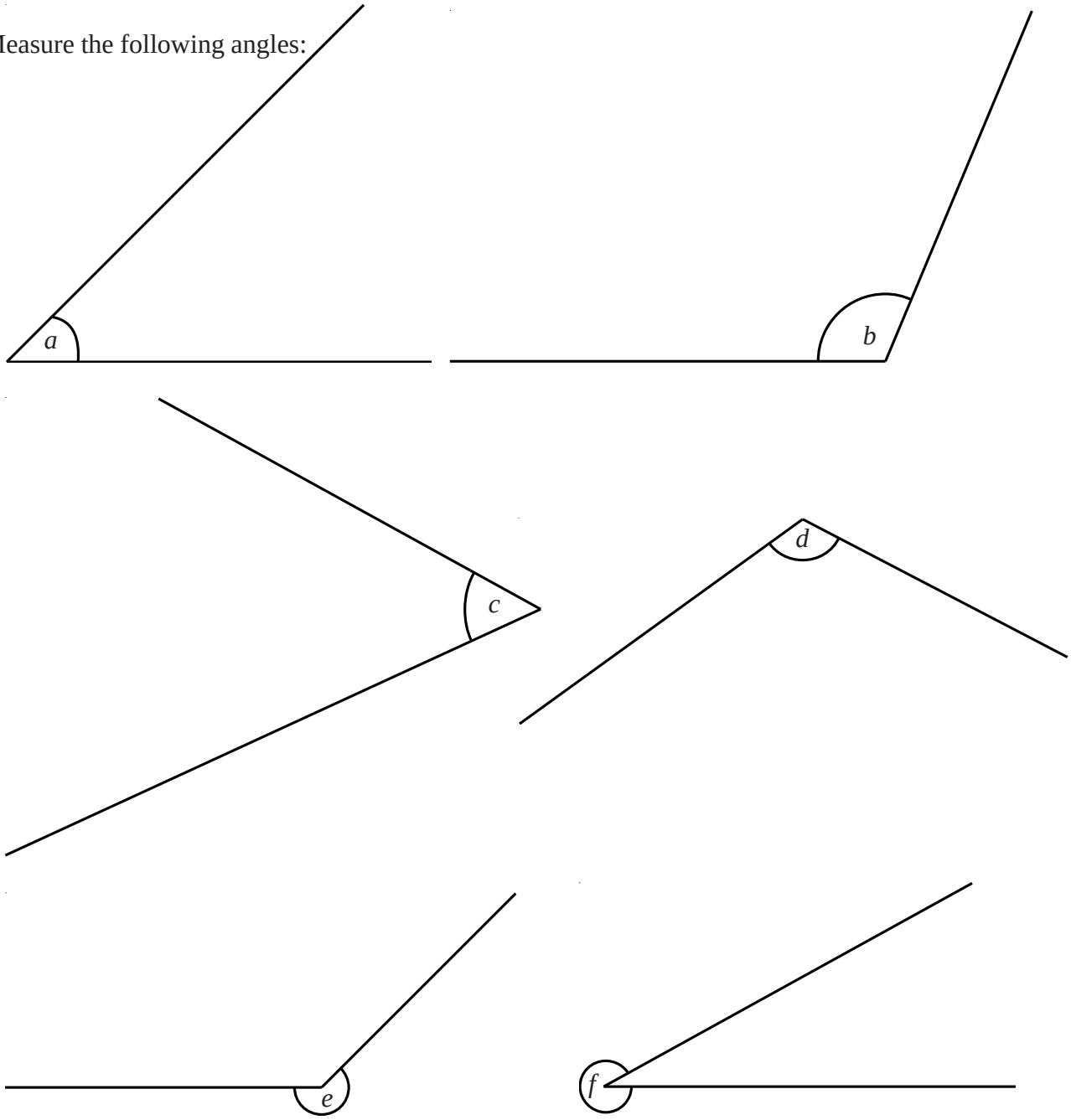
6) Find the midpoint of *A* and *B* where *A* has coordinates (-7, -4) and *B* has coordinates (-2, -1).

7) The midpoint of *A* and *B* is at (1, 3).
The coordinates of *A* are (-2, 4).
Work out the coordinates of *B*.

8) The midpoint of *A* and *B* is at (3.5, 2.5).
The coordinates of *A* are (2, 5).
Work out the coordinates of *B*.

Measuring and Drawing Angles

1) Measure the following angles:

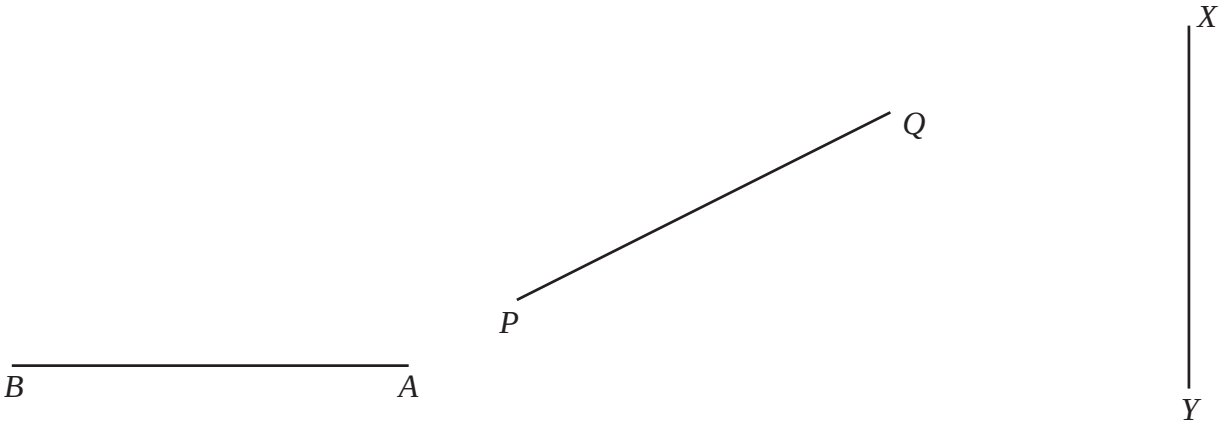


2) Draw the following angles:

a) Angle $ABC = 60°$

b) Angle $PQR = 127°$

c) Angle $XYZ = 275°$



Drawing Triangles

1) The diagram shows a sketch of triangle *ABC*.

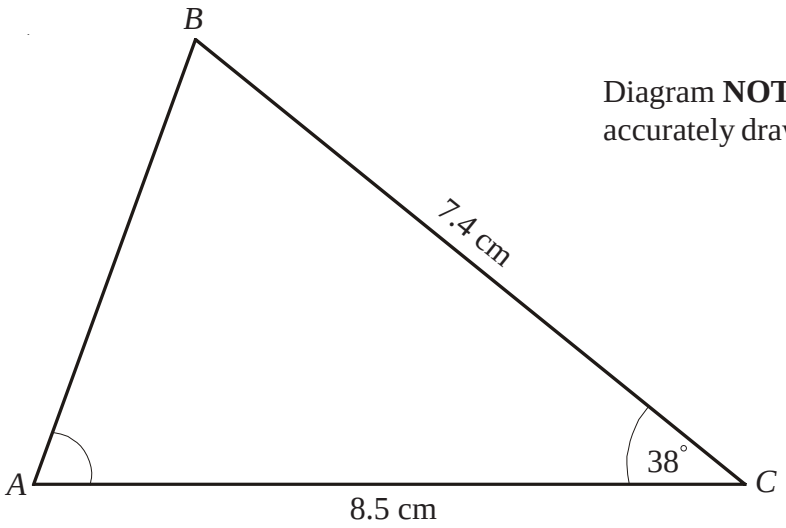


Diagram **NOT** accurately drawn

BC = 7.4 cm
AC = 8.5 cm
Angle *C* = 38°

a) Make an accurate drawing of triangle *ABC*.

b) Measure the size of angle *A* on your diagram.

2) Use ruler and compasses to **construct** an equilateral triangle with sides of length 6 centimetres.
You must show all construction lines.

3) The diagram shows a sketch of triangle *PQR*.

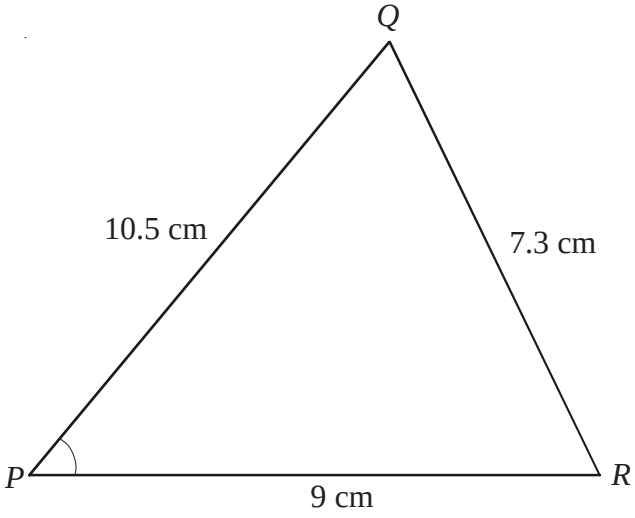


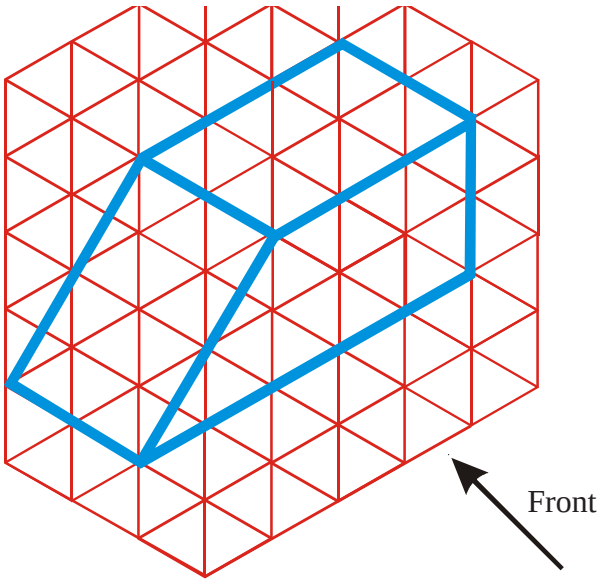
Diagram **NOT** accurately drawn

a) Use ruler and compasses to make an accurate drawing of triangle *PQR*.

b) Measure angle *P*.

Plans and Elevations

1) The diagram shows a prism drawn on an isometric grid.

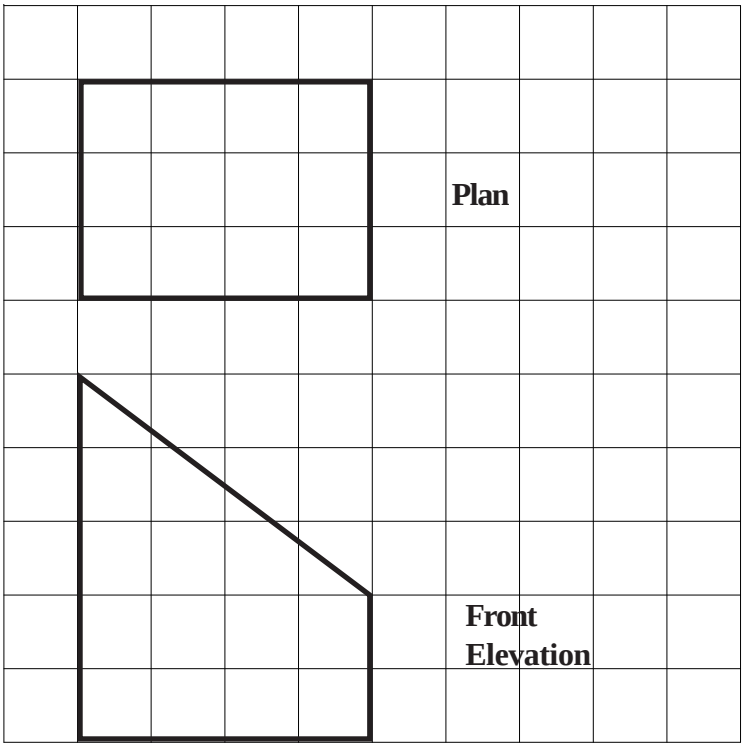


a) On the grid below, draw the front elevation of the prism from the direction marked by the arrow.

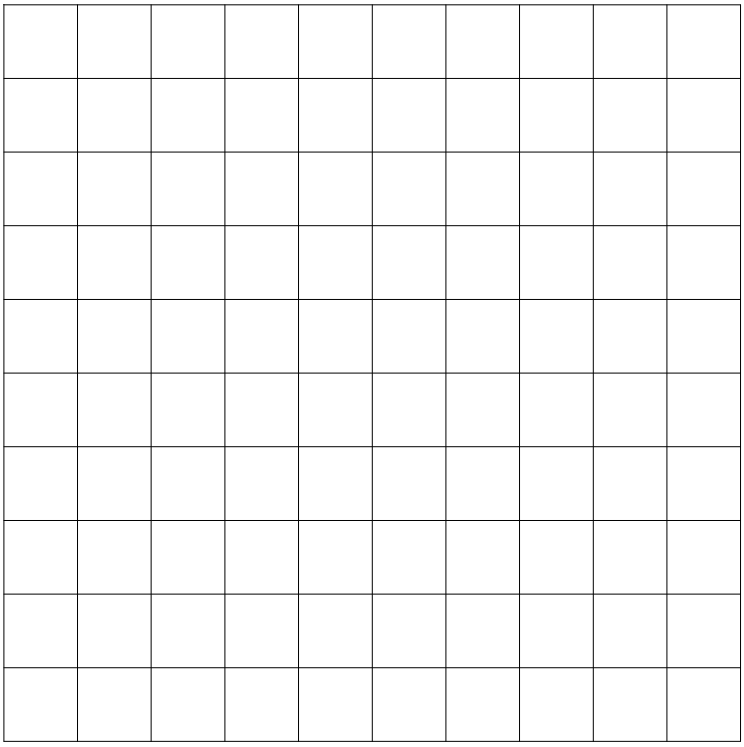
b) On the grid below draw a plan of the prism.

Plans and Elevations

1) Here is the plan and front elevation of a prism.
The front elevation shows the cross section of the prism.

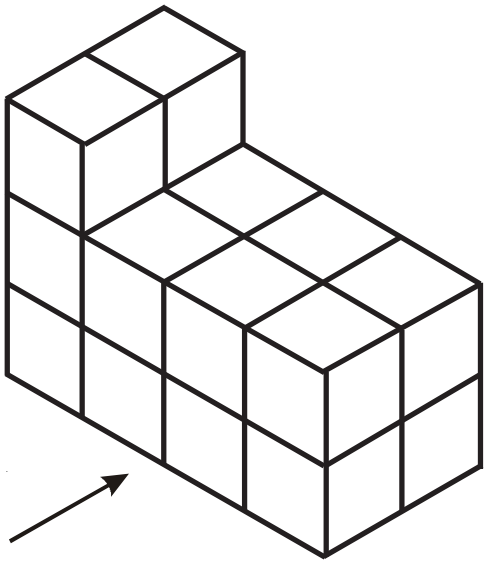


On the grid below, draw the side elevation of the prism.



Plans and Elevations

1) The diagram shows a solid prism made from centimetre cubes.

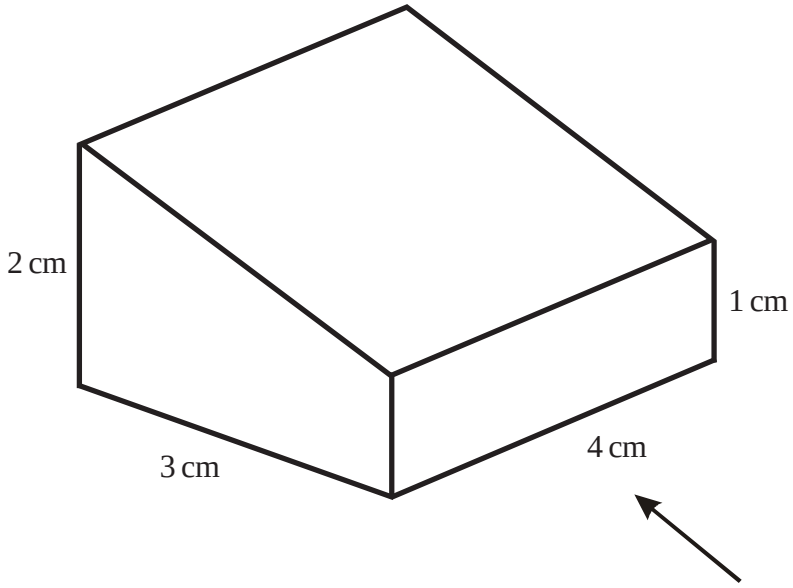


a) On the centimetre square grid, draw the front elevation of the solid prism from the direction shown by the arrow.

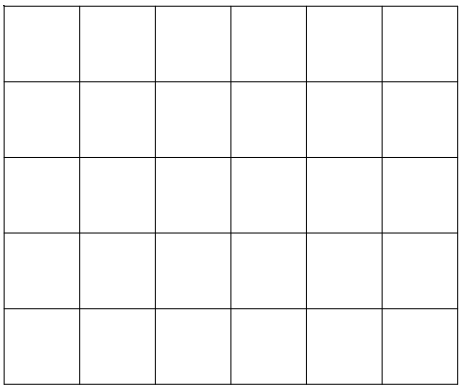
b) On the centimetre square grid below, draw the plan of the solid prism.

Plans and Elevations

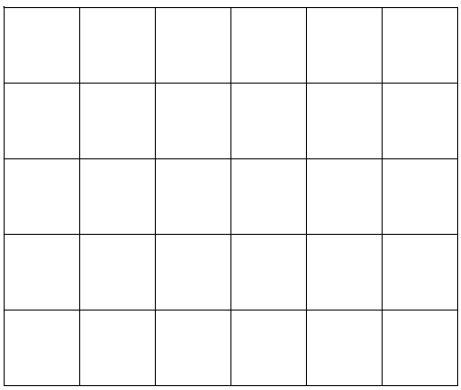
1) The diagram shows a solid prism.



a) On the grid below, draw the front elevation of the prism from the direction of the arrow.



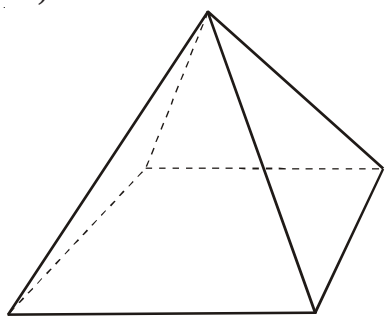
b) On the grid below, draw the plan of the prism.



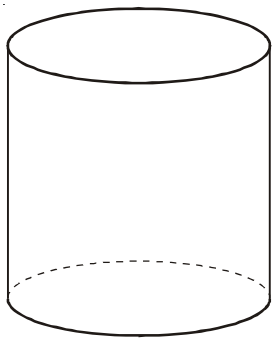
Nets

1) Sketch nets of these solids.

a)

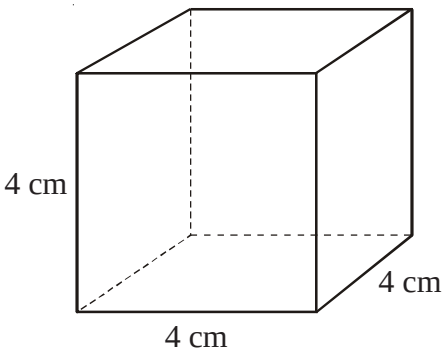


b)

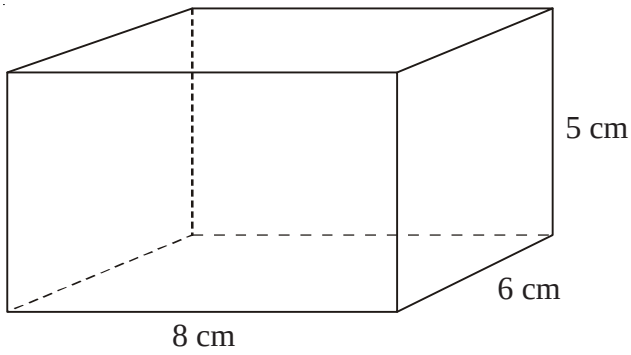


2) On squared paper draw accurate nets of these solids.

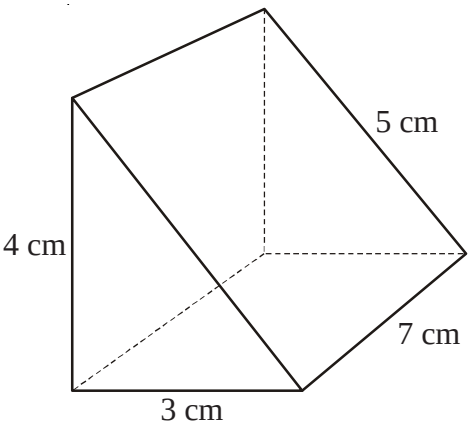
a) **Cube**



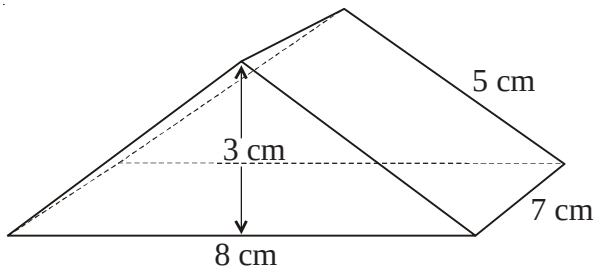
b) **Cuboid**



c) **Right-angled triangular prism**

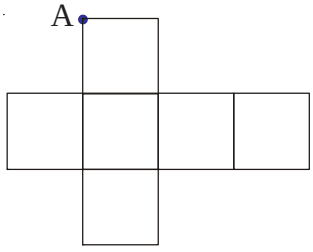


d) **Triangular prism**

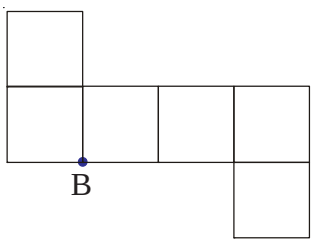


3) The two nets, below, are folded to make cubes.
Two other vertices will meet at the the dot, A. Mark them with As.
One other vertex will meet the dot B. Mark it with B.

a)

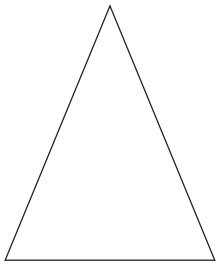


b)

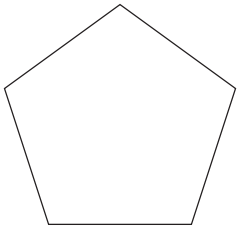


Symmetries

1) Draw all the lines of symmetry on the triangle and the rectangle.

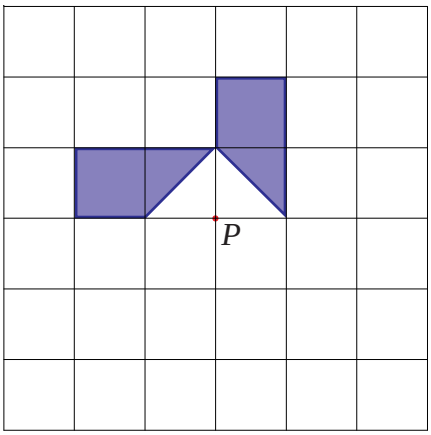


2) What is the order of rotational symmetry of the two shapes below?



S

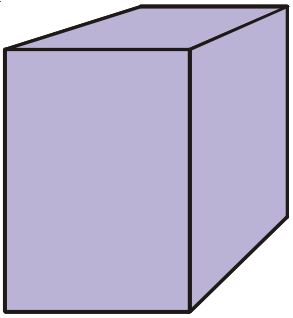
3) The diagram below, shows part of a shape.

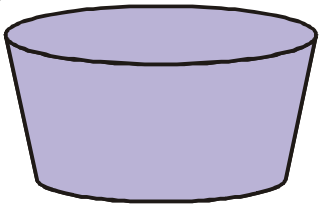


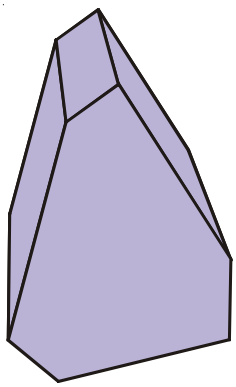
The shape has rotational symmetry of order 4 about point *P*.

Complete the shape.

4) On each of the shapes below, draw one plane of symmetry.







Questionnaires and Data Collection

1) Claire wants to find how much time pupils spend on their homework.
She hands out a questionnaire with the question

How much time do you spend on your homework?

A lot ☐ *Not much* ☐

a) Write down two things that are wrong with this question

_____

_____

b) Design a suitable question she could use.
You should include response boxes.

2) Tony wants to know which type of programme pupils in his class like watching on TV.
Design a suitable data collection sheet he could use to gather the information.

3) Emma asked 20 people what was their favourite pet.
Here are their answers.

cat	cat	hamster	cat
mouse	hamster	cat	dog
dog	dog	snake	hamster
cat	cat	hamster	dog
cat	hamster	snake	cat

Design and complete a suitable data collection sheet that Emma could have used to collect and show this information.

Two-Way Tables

1) Billy has been carrying out a survey.
He asked 100 people the type of water they like to drink (still, sparkling or both).
Here are part of his results:

	Still	**Sparkling**	**Both**	**Total**
Male	26			53
Female		20	10	
Total			16	100

a) Complete the two-way table.

b) How many males were in the survey?

c) How many females drink only still water?

d) How many people drink only sparkling water?

2) 90 students each study one of three languages.
The two-way table shows some information about these students.

	French	**German**	**Spanish**	**Total**
Female				
Male		7		
Total	20	18		90

50 of the 90 students are male.

29 of the 50 male students study Spanish.

a) Complete the two-way table.

b) How many females study French?

c) How many people study Spanish?

3) Karen asks 100 students if they like milk, plain or white chocolates best.

36 of the students are girls.

19 of these girls like milk chocolates best.

16 boys like white chocolates best.

8 out of the 24 students who like plain chocolates best are girls.

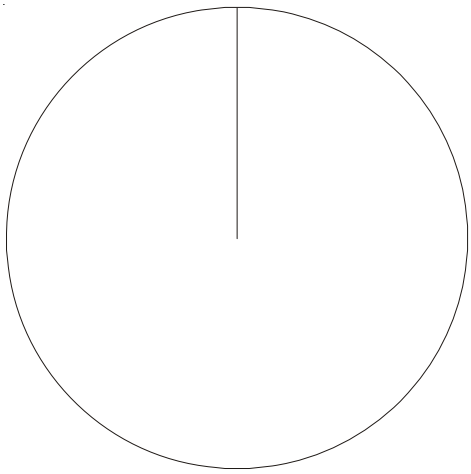
Work out the number of students who like milk chocolates the best.

Pie Charts

1) Patrick asked some of his colleagues which was their favourite holiday destination.
The table shows the results.

City	Frequency
Alicante	8
Paris	7
Ibiza	15
St Lucia	1
Biarritz	9

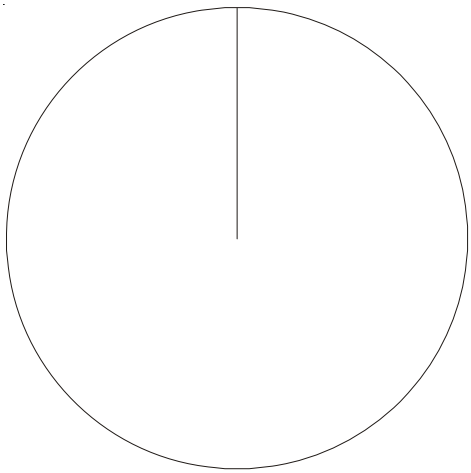
Draw a pie chart to illustrate the information.



2) Brian asked 60 people which region their favourite rugby team came from.
The table shows the results.

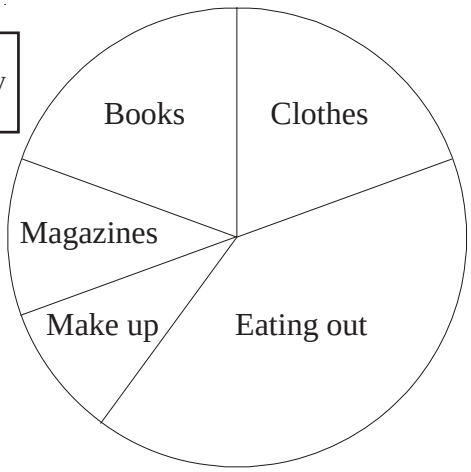
Region	Frequency
Southern England	9
London	23
Midlands	16
Northern England	12
Total	60

Draw a pie chart to illustrate the information.



3) Sophie represents her monthly expenses using a pie chart.

Diagram accurately drawn



Numbers from her table have been rubbed out by mistake.
Use the pie chart to complete the table.

		Angle
Clothes	£35	
Eating out		
Make up	£17	34°
Magazines		
Books		
Total	£180	

Scatter Graphs

1) The scatter graph shows some information about the marks of six students.

It shows each student's marks in Maths and Science.

The table below shows the marks for four more students.

Maths	22	8	17	26
Science	30	12	24	24

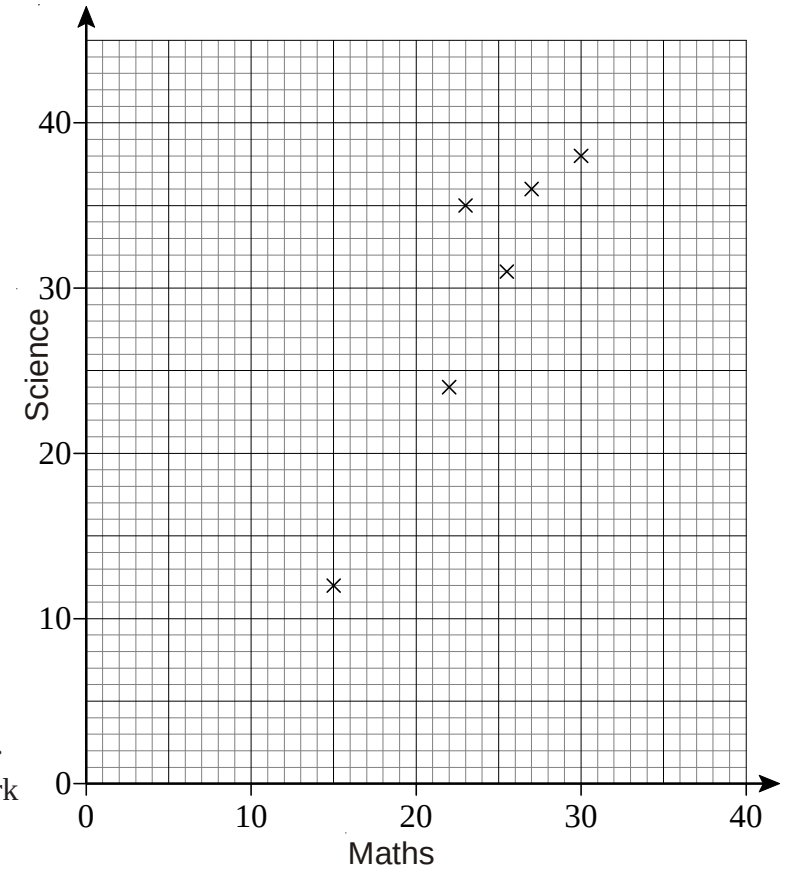
a) On the scatter graph, plot the information from the table.

b) Draw a line of best fit.

c) Describe the correlation between the marks in Maths and the marks in Science.

Another student has a mark of 18 in Science.

d) Use the line of best fit to estimate the mark in Maths of this student.



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2) The table below shows the average daily number of hours sleep of 10 children.

Age (years)	4	2	5	1	9	6	8	7	10	1.5
Number of hours sleep	14	13	12.5	15	10	12.5	10.8	12	11	14

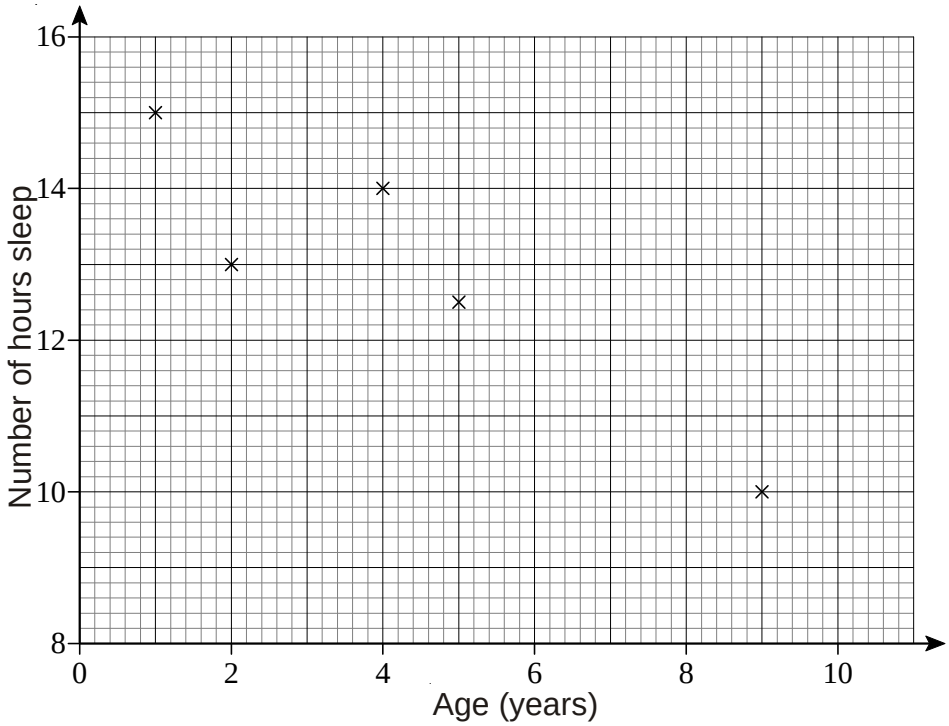
The first five results have been plotted on the scatter diagram.

a) Plot the next five points.

b) Draw a line of best fit.

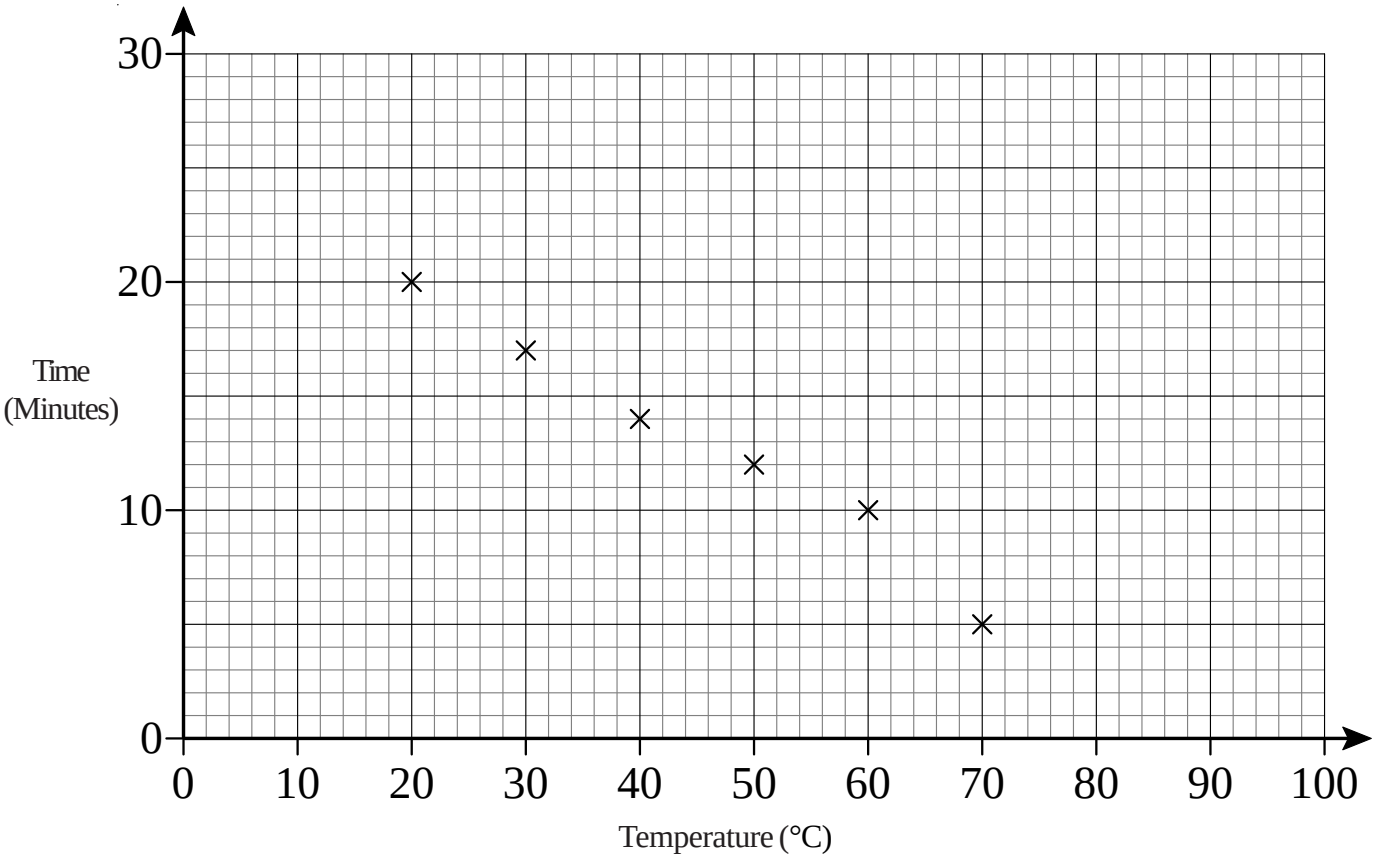
c) Describe the relationship between the age of the children and their number of hours sleep per day.

d) Use your scatter graph to estimate the number of hours sleep for a 3 year old child.



Scatter Graphs

1) Sue did an experiment to study the times, in minutes, it took 1 cm ice cubes to melt at different temperatures.
Some information about her results is given in the scatter graph.



The table shows the results from two more experiments.

Temperature (°C)	15	55
Time (Minutes)	21	15

a) On the scatter graph, plot the results from the table.

b) Describe the relationship between the temperature and the time it takes a 1 cm ice cube to melt.

c) Find an estimate for the time it takes a 1 cm ice cube to melt when the temperature is 25 °C.

Sue's data cannot be used to predict how long it will take a 1 cm ice cube to melt when the temperature is 100 °C.

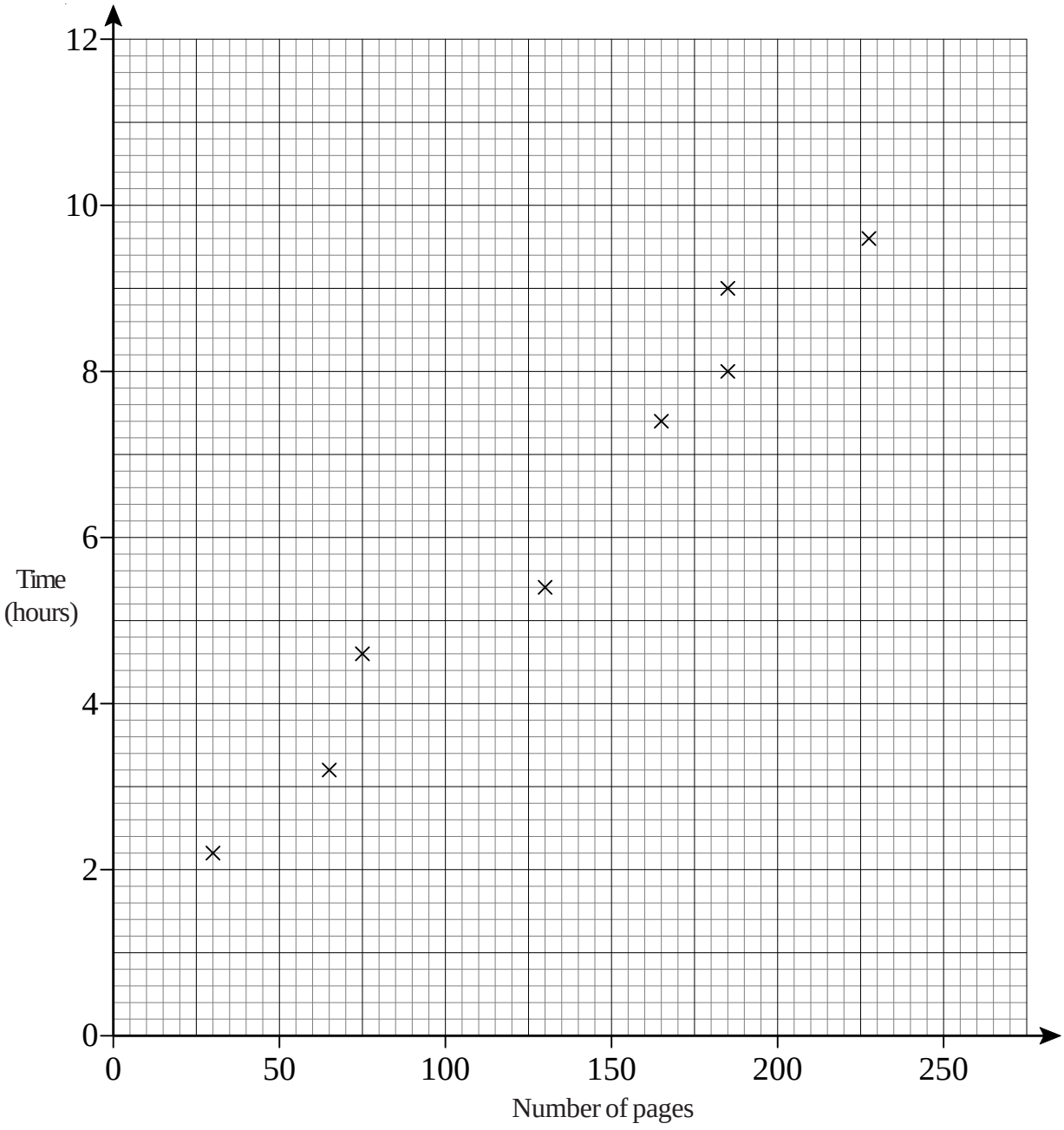
d) Explain why.

Scatter Graphs

1) Henry reads eight books.

For each book he recorded the number of pages and the time he took to read it.

The scatter graph shows information about his results.



a) Describe the relationship between the number of pages in a book and the time Henry takes to read it.

Henry reads another book.

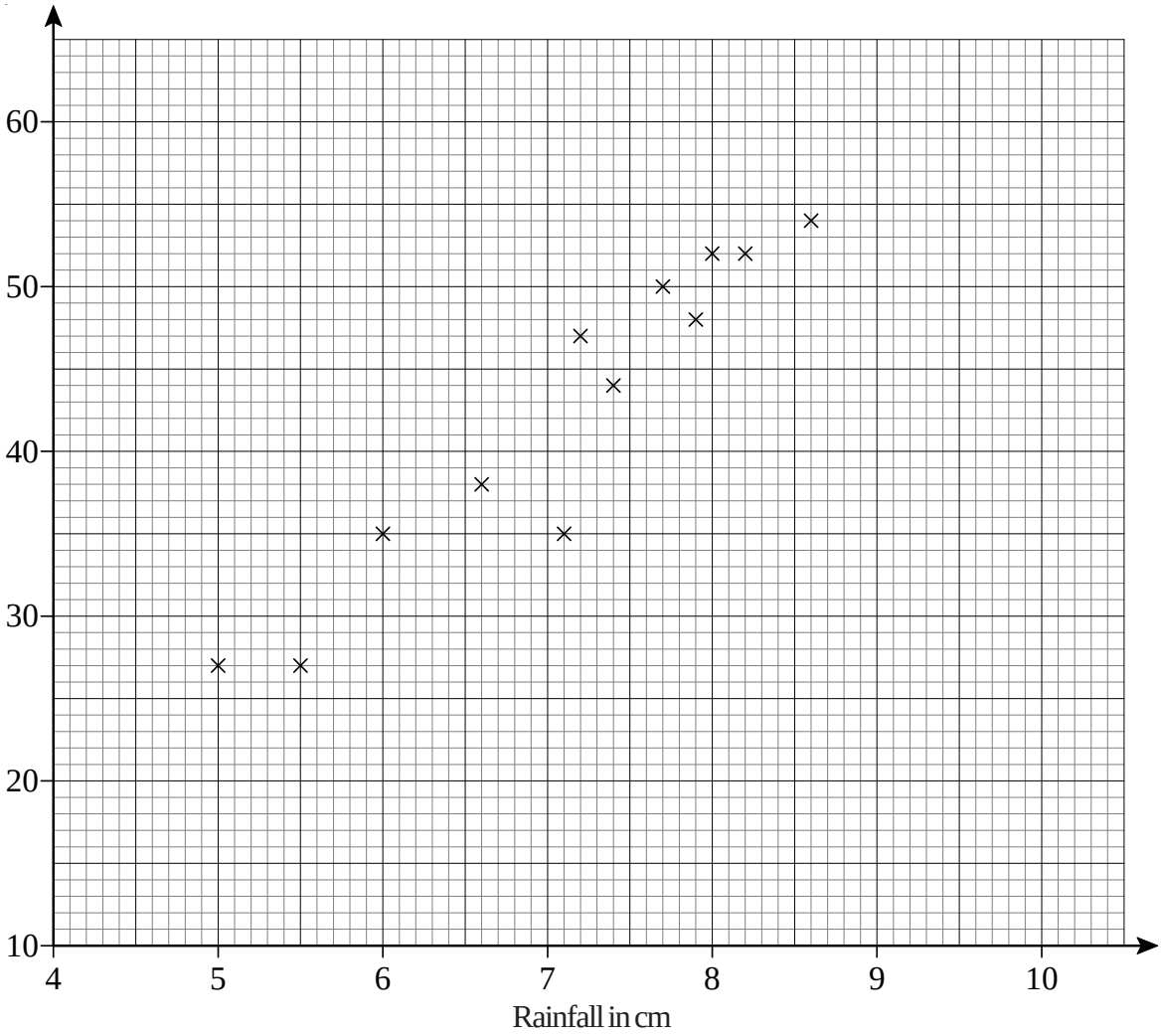
The book has 150 pages.

b) Estimate the time it takes Henry to read it.

Scatter Graphs

1) Mr Jones sells umbrellas.

The scatter graph shows some information about the number of umbrellas he sold and the rainfall, in cm, each month last year.



In January of this year, the rainfall was 6.2 cm.

During January, Mr Jones sold 32 umbrellas.

a) Show this information on the scatter graph.

b) What type of correlation does this scatter graph show?

In February of this year, Mr Jones sold 40 umbrellas.

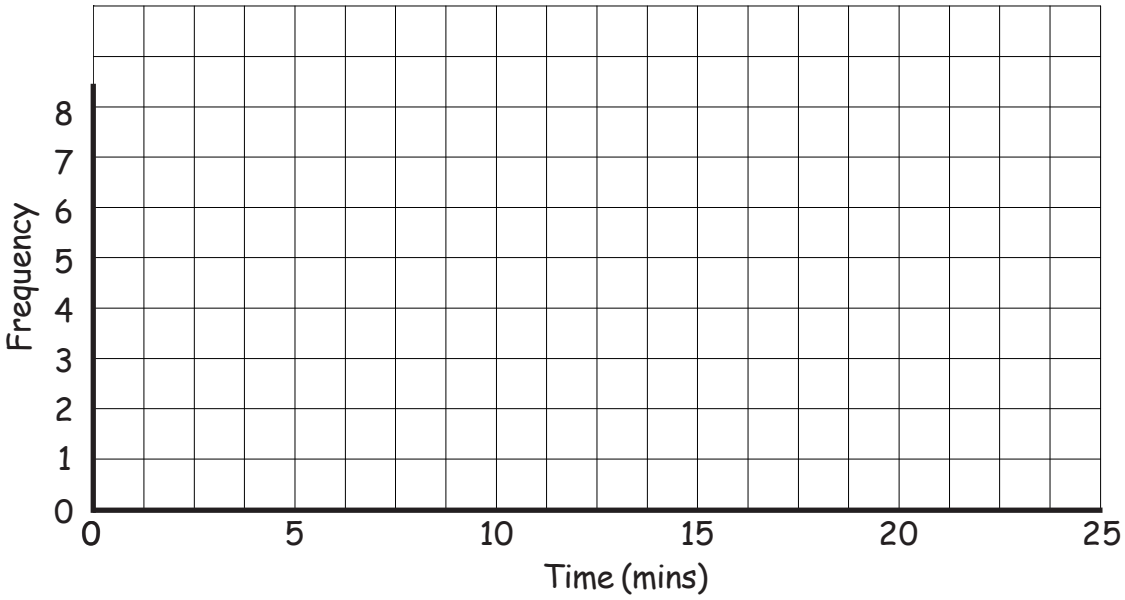
c) Estimate the rainfall for February.

Frequency Diagrams

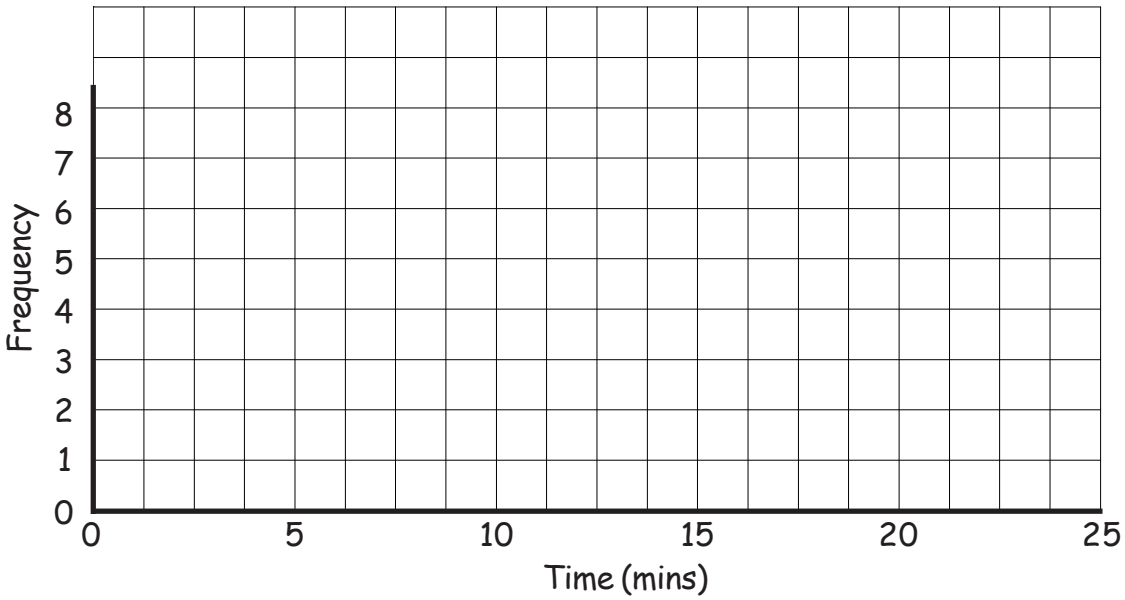
1) A class of pupils is asked to solve a puzzle.
The frequency table below shows the times taken by the pupils to solve the puzzle.

Time (t) in min	Frequency
$0 < t \leqslant 5$	3
$5 < t \leqslant 10$	4
$10 < t \leqslant 15$	5
$15 < t \leqslant 20$	7
$20 < t \leqslant 25$	5

a) Draw a frequency diagram to show this information.



b) Draw a frequency polygon to show this information.



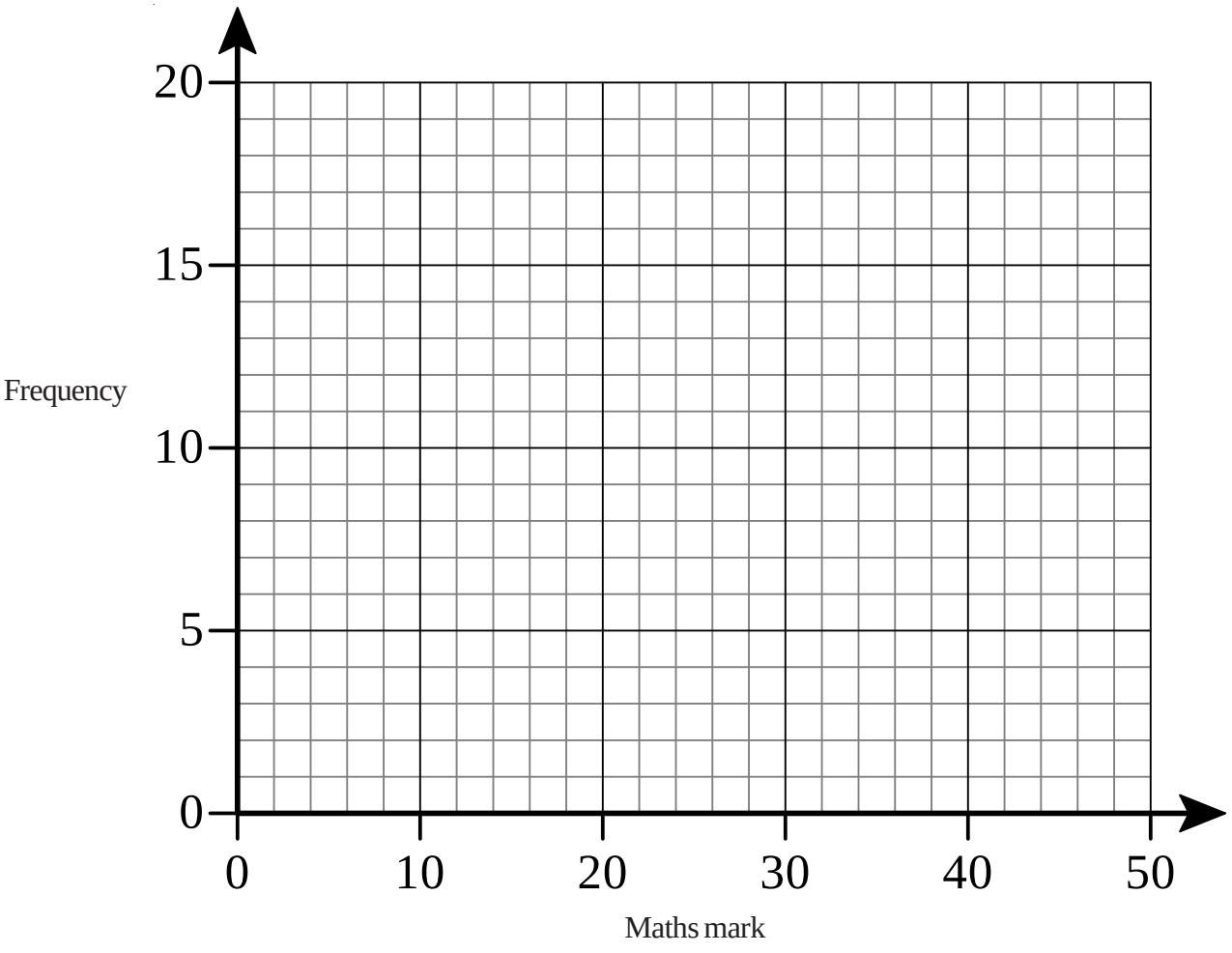
Frequency Diagrams

1) 60 students take a Maths test.
The test is marked out of 50.

This table shows information about students' marks.

Maths mark	0 - 10	11 - 20	21 - 30	31 - 40	41 - 50
Frequency	3	13	18	19	7

On the grid, draw a frequency polygon to show this information.

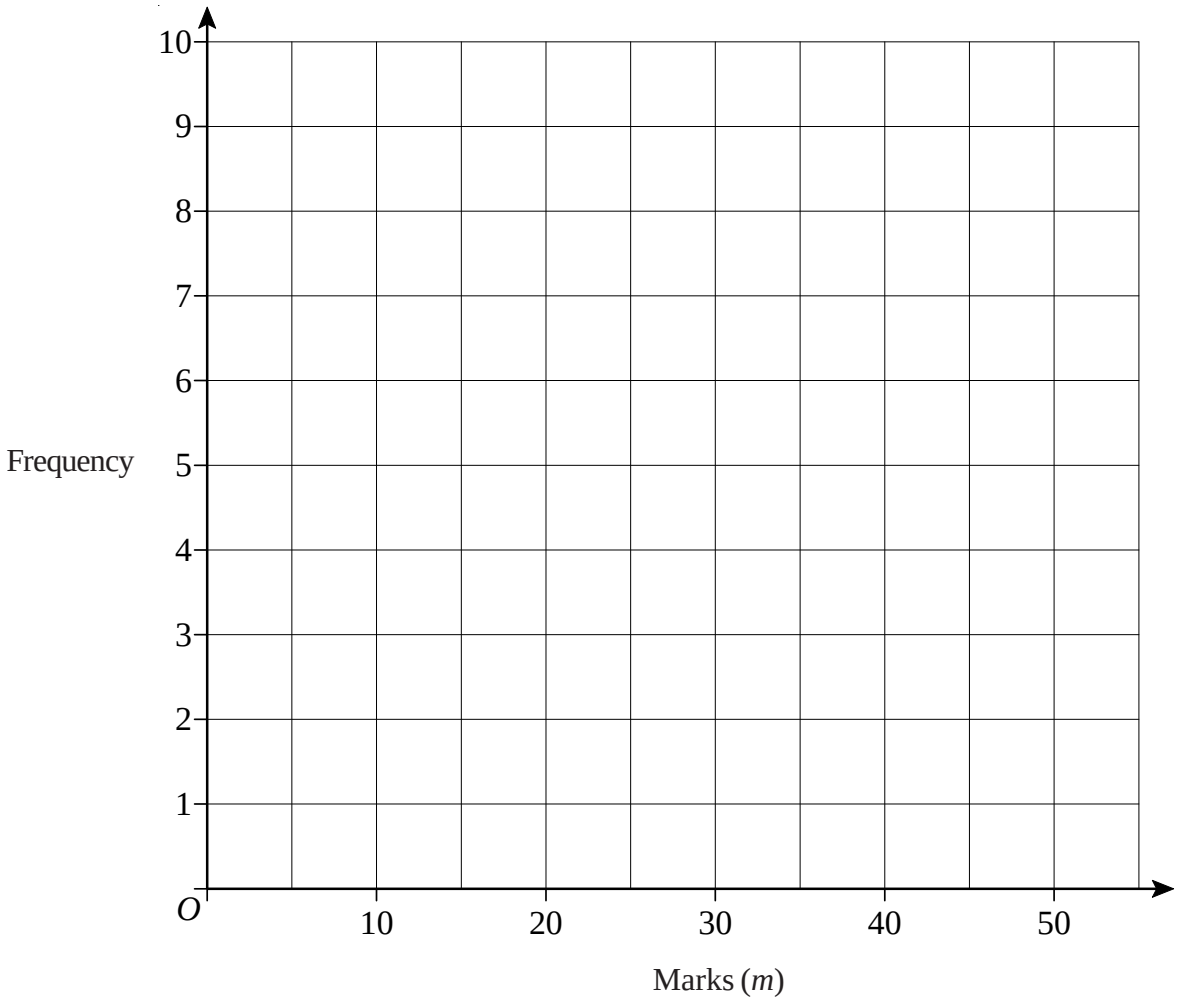


Frequency Diagrams

1) 30 students took a test.
The table shows information about how many marks they gained in the test.

Marks (m)	Frequency
$0 < m \leqslant 10$	4
$10 < m \leqslant 20$	8
$20 < m \leqslant 30$	9
$30 < m \leqslant 40$	6
$40 < m \leqslant 50$	3

On the grid, draw a frequency polygon for this information.



Frequency Diagrams

1) The table shows some information about the ages, in years, of 60 people.

Age (in years)	Frequency
0 to 9	5
10 to 19	14
20 to 29	12
30 to 39	9
40 to 49	7
50 to 59	3
60 to 69	10

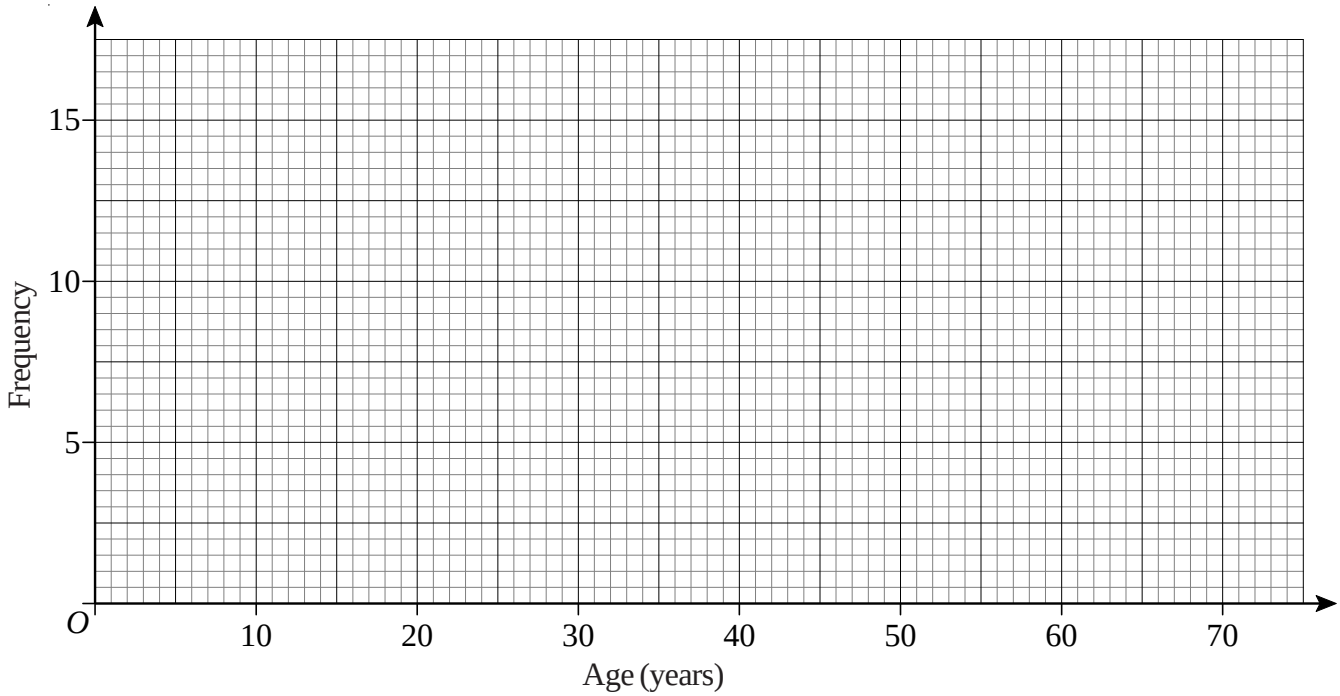
a) Write down the modal class.

Colin says

'The median lies in the class 30 to 39'

Colin is wrong.

b) Explain why.



c) On the grid, draw a frequency polygon for the information in the table.

Stem and Leaf Diagrams

1) 16 students sat a Maths test.
Here are their marks:

64	72	39	45	49	67	73	50
73	44	55	77	51	62	64	79

Draw a stem and leaf diagram to show this information.

2) Pat is carrying out a survey on how tall pupils in her class are.
Here are their heights in cm:

173	162	170	169	163	173	156
159	161	168	177	182	170	169

Draw a stem and leaf diagram to show this information.

3) The stem and leaf diagram, below, shows information about the times, in minutes, it takes a group of people to eat their breakfast.

0	5	7	9		
1	0	0	5	8	8
2	0	2	3	5	7
3	2	5			

Key: 1 | 0 represents 10 minutes.

a) How many people are in the group?

b) How many people spend 15 minutes or more eating their breakfast?

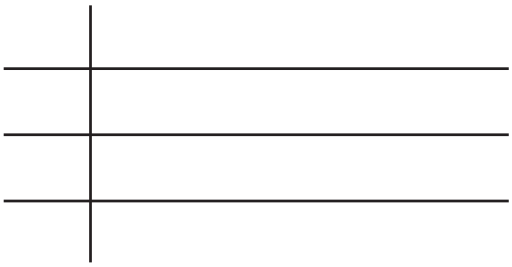
c) Find the median time that it took to eat breakfast.

Stem and Leaf Diagrams

1) Here are the ages, in years, of 15 office workers.

34	54	42	27	36
23	31	41	50	35
44	29	45	45	53

Draw an ordered stem and leaf diagram to show this information.
You must include a key.



Key:

2) Tony collected some information about the heights of 21 plants.
This information is shown in the stem and leaf diagram.

1	1	1	3	5			
2	3	4	5	9	9		
3	0	2	3	3	5	7	8
4	1	2	4	8	9		

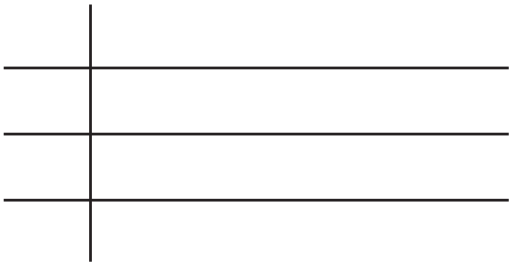
Key 3|6 means 36 mm

Find the median.

3) Here are the ages, in years, of 16 people.

36	47	18	22	36	28	45	30
38	27	41	16	36	48	28	21

a) Draw an ordered stem and leaf diagram to show this information.
You must include a key.



Key:

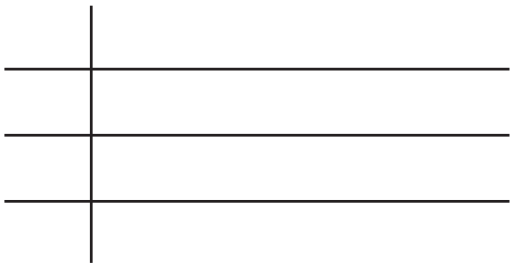
b) Find the median age.

Stem and Leaf Diagrams

1) Here are the weights in grams, to the nearest gram, of 15 eggs.

34	45	42	54	50
37	61	44	56	52
63	57	51	37	64

Draw an ordered stem and leaf diagram to show this information.
You must include a key.

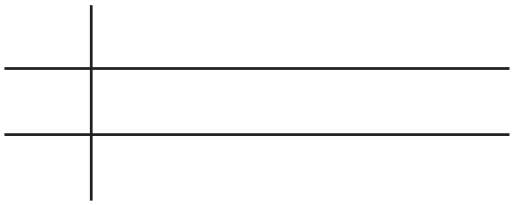


Key:

2) Here are the weights, in grams, of 16 eggs.

46	44	50	52	45	60	54	61
59	55	56	47	53	61	57	58

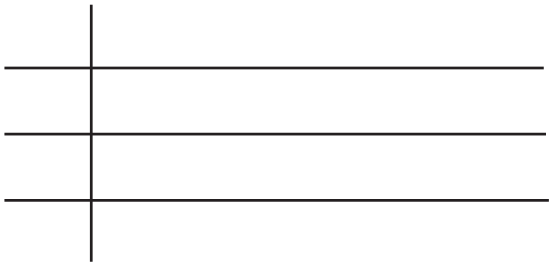
Draw an ordered stem and leaf diagram to show this information.
You must include a key.



Key:

3) Sue plays golf.
Here are 15 of her scores.

68	75	81	85	79
81	90	76	92	83
72	82	81	77	72



Draw an ordered stem and leaf diagram to show this information.
You must include a key.

Key:

Simple Probability

1) A blue dice and a red dice are rolled.

a) How many different outcomes are possible?

b) List the possible outcomes.

2) Three coins are flipped.

One possible outcome is H, H, H

List all the outcomes.

3) If five coins are flipped, how many possible outcomes are there?

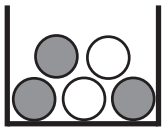
4) A dice is rolled and a coin is flipped.

List all the possible outcomes.

5) A box contains 3 grey counters and 2 white counters.

A counter is taken from the box at random.

What is the probability of choosing a white counter?



6) There are 3 blue counters, 5 red counters and 7 green counters in a bag.

A counter is taken from the bag at random.

a) What is the probability that a green counter will be chosen?

b) What is the probability that a blue or red counter will be chosen?

7) In a class there are 10 boys and 15 girls.

A teacher chooses a student at random from the class.

Eric says that the probability a boy will be chosen is 0.5 because a student can be either a boy or a girl.

Jenny says that Eric is wrong.

Decide who is correct - Eric or Jenny - giving reasons for your answer.

8) Spinner A has numbers 1 to 4 on it.

Spinner B has numbers 1 to 3 on it.

Both spinners are spun and the numbers on each are added together to give a score.

What is the probability that the score will be

a) 7?

b) 3 or 4?

Mutually Exclusive Events

1) If the probability of passing a driving test is 0.54,
what is the probability of failing it?

2) The probability that a football team will win their next game is $\frac{2}{11}$.
The probability they will lose is $\frac{3}{11}$.
What is the probability the game will be a draw?

3) On the school dinner menu there is only ever one of four options.
Some of the options are more likely to be on the menu than others.
The table shows the options available on any day, together with three of the probabilities.

Food	Curry	Sausages	Fish	Casserole
Probability	0.36	0.41		0.09

a) Work out the probability of the dinner option being Fish.

b) Which option is most likely?

c) Work out the probability that it is a Curry or Sausages on any particular day.

d) Work out the probability that it is **not** Casserole.

4) Julie buys a book every week.
Her favourite types are Novel, Drama, Biography and Romance.
The table shows the probability that Julie chooses a particular type of book.

Type of book	Novel	Drama	Biography	Romance
Probability	0.24	0.16	*x*	*x*

a) Work out the probability that she will choose a Novel or a Drama.

b) Work out the probability that she will choose a Biography or a Romance.

The probability that she will choose a Biography is the same as the probability she will choose a Romance.

c) Work out the probability that she will choose a Biography.