

read, write, order numbers to at least 1,000,000 and determine the value of each digit	count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	interpret negative numbers in context; count forwards and backwards with positive and negative whole numbers, including through zero	round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000	solve number problems and practical problems that involve all of the above	read Roman numerals to 1000 (M) and recognise years written in Roman numerals	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers	know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	establish whether a number up to 100 is prime and recall prime numbers up to 19	multiply numbers up to 4 digits by a one or two-digit number using a formal written method, for two-digit numbers	multiply and divide numbers mentally, including using long multiplication drawing upon known facts	divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	recognise and use square numbers and cube numbers; notation for squared ( $^2$ ) and cubed ( $^3$ )
solve problems involving multiplication and division, including using their knowledge of factors and multiples; squares and cubes	solve problems involving addition, subtraction, multiplication and division and a combination of these including understanding the meaning of the equals sign	solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates			compare and order fractions whose denominators are all multiples of the same number	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	add and subtract fractions with the same denominator and denominators that are multiples of the same number
multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$ ]	recognise and use thousandths and relate hundredths and decimal equivalents				read, write, order numbers with up to three decimal places	solve problems involving number up to three decimal places
recognise the per cent symbol (%), and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal	solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{3}{4}$ , and those fractions with a denominator of a multiple of 10 or 25.	convert between different units of metric measure (for example, kilometre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	understand and use approximate equivalents between metric units and common imperial units such as inches, pounds and pints	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	calculate the area and compare the area of rectangles (including squares), and including using standard units, square centimetres ( $cm^2$ ) and square metres ( $m^2$ ) and estimate the area of irregular shapes	estimate volume (for example, using $1\text{ cm}^3$ blocks to build cuboids (including cubes)) and capacity (for example, using water)	use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation, including scaling.
identify 3-D shapes, including cubes and other cuboids; from 2-D representations	know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles	draw given angles, and measure them in degrees ( $^\circ$ )	identify: <ul style="list-style-type: none"> <li>angles at a point and one whole turn (total <math>360^\circ</math>)</li> <li>angles at a point on a straight line and a full turn (total <math>360^\circ</math>)</li> <li>other multiples of <math>90^\circ</math></li> </ul>	use the properties of rectangles to deduce related facts and find missing lengths and angles	distinguish between regular and irregular polygons based on reasoning about equal sides and angles	identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	complete, read and interpret information in tables, including timetables

# Stage 5

# Mathematics



**1 a)** Write these numbers using numerals:

**i)** Four hundred and two thousand, two hundred and sixty:

.....

**ii)** Four hundred and two thousand, two hundred and six:

.....

**iii)** Four hundred and two thousand, two hundred and sixteen:

.....

**b)** Write these numbers in words:

**i)** 343 817: .....

.....

**ii)** 300 817: .....

.....

**iii)** 300 007: .....

.....

*(NPV1, 6 marks)*

**2** Find the next two numbers:

**a)** 70 000, 80 000, 90 000, ....., .....

**b)** 2700, 2800, 2900, ....., .....

**c)** 210, ....., ....., 180, 170

*(NPV2, 3 marks)*



- 3 a) 5°C warmer than 2°C is .....°C
- b) 3°C colder than 4°C is .....°C
- c) 4°C colder than 3°C is .....°C
- d) 5°C warmer than -2°C is .....°C
- e) 4°C colder than -2°C is .....°C
- f) 5°C warmer than -8°C is .....°C

(NPV3, 6 marks)

4 Round 567 457 to:

567 457
---------

- a) the nearest 10: .....
- b) the nearest 100: .....
- c) the nearest 1000: .....
- d) the nearest 10 000: .....
- e) the nearest 100 000: .....

(NPV4, 5 marks)

5 Alesha thinks of a whole number.

When rounded to the nearest 10 000, the number is 990 000.

- a) What is the largest possible value of Alesha's number?  
.....
- b) What is the smallest possible value of Alesha's number?  
.....

(NPV5, 2 marks)



**6 a)** Convert the Arabic numbers into Roman Numerals:

**i)** 1000 = .....

**iii)** 120 = .....

**ii)** 400 = .....

**iv)** 309 = .....

**b)** Convert the Roman Numerals into Arabic numbers:

**i)** CCL = .....

**iii)** DC = .....

**ii)** CXC = .....

**iv)** CMXCIX = .....

*(NPV6, 8 marks)*



7 Calculate

a)  $22\,167 + 2874$


.....

c)  $32\,214 - 7148$


.....

b)  $314\,769 + 267\,267$


.....

d)  $523\,334 - 367\,815$


.....

(AS1, 8 marks)

8 a) Fred calculates the answer to  $7000 - 1765$  as shown:

$$5 + 30 + 200 + 5000 = 5235$$

Does Fred's method give the correct answer?

Explain Fred's method

.....

.....

.....



b) Tracey says  $41\,124 - 20\,463 = 21\,341$  because:

$$"41\,000 - 20\,000 = 21\,000$$

$$400 - 100 = 300$$

$$60 - 20 = 40$$

$$4 - 3 = 1$$

$$\text{so } 41\,124 - 20\,463 = 21\,341"$$

Do you agree with Tracey?

Explain your answer

.....

.....

.....

(AS2, 4 marks)

9 Karen is given the calculation  $11\,879 - 3\,998$ .

She estimates that the answer is 8000.

Do you agree with Karen? Explain your answer.

.....

.....

.....

(AS3, 2 marks)



10 a) Pete is trying to solve the problem:

*24 567 people were at the match last week and there are 2487 more this week.  
How many more people need to attend to bring the total to the club's target of 30 000 people?*

i) Pete draws a diagram to help.

Place a (✓) by the correct diagram.

30 000		
24 567	2487	Extra people

Extra people		
30 000	24 567	2487

24 567		
30 000	2487	Extra people

ii) Solve the problem

..... people

b) Find the missing digits in this calculation

$$\begin{array}{r}
 7 \square 63 \\
 + \quad 78 \square \\
 \hline
 82 \square 2
 \end{array}$$

(AS4, 5 marks)



**11 a)** Bob's age is a multiple of 5 and a one less than a multiple of 6.

How old is Bob?

.....

**b)** Find all the factors of 36

.....

**c)** Find a common factor of 36 and 12.

.....

(MD1, 5 marks)

**12** Pat thinks that 9 is a prime number

John thinks that 9 is a composite number.

Who is correct? Explain your answer.

.....

.....

.....

(MD2, 2 marks)

**13** Write down a prime number between 80 and 90

.....

(MD3, 1 mark)





14 Calculate:

a)  $60 \times 4$

.....

c)  $102 \div 3$

.....

b)  $120 \times 80$

.....

d)  $1200 \div 40$

.....

(MD4, 8 marks)

15 Calculate

a)  $67 \times 47$


.....

c)  $5476 \times 7$


.....

b)  $476 \times 67$


.....

d)  $2345 \times 67$


.....

(MD5, 10 marks)



16 Find the value of  $\Delta$  in each of these statements:

a)  $2.3 \times 10 = \Delta$

$\Delta = \dots\dots\dots$

b)  $\Delta \times 10 = 16$

$\Delta = \dots\dots\dots$

c)  $\Delta \times 100 = 110$

$\Delta = \dots\dots\dots$

d)  $1.2 \times 1000 = \Delta$

$\Delta = \dots\dots\dots$

e)  $\Delta \div 10 = 47$

$\Delta = \dots\dots\dots$

f)  $230 \div 100 = \Delta$

$\Delta = \dots\dots\dots$

g)  $\Delta \div 1000 = 2.5$

$\Delta = \dots\dots\dots$

h)  $1.8 \times \Delta = 180$

$\Delta = \dots\dots\dots$

(MD6, 8 marks)

17 a) Jess thinks that  $5^2 = 25$

Do you agree with Jess?

Explain your answer

.....

.....

.....

b) Calculate

i)  $4^3 = \dots\dots\dots$

ii) 3 squared =  $\dots\dots\dots$

iii) 5 cubed =  $\dots\dots\dots$

(MD7, 5 marks)



18 Calculate

a)  $477 \div 9$


c)  $1730 \div 8$


.....

.....

(MD8, 4 marks)

19 Egg boxes hold 6 eggs.

Kate collects 250 eggs.

How many boxes can she fill?


.....

(MD9, 3 marks)

20 Find the value of  $\Delta$ :

$$6789 - 4321 = \Delta \div 4$$

$\Delta = \dots\dots\dots$

(MD10, 3 marks)



**21** A football pitch is 60 metres wide and 100 metres long.

A scale plan of it is drawn with a width of 3 centimetres

What is the length of the scale drawing?.

.....  
(MD11, 2 marks)



22 Complete the statements using the symbols  $<$ ,  $>$  or  $=$

a)  $\frac{3}{6}$    $\frac{1}{2}$

d)  $\frac{3}{10}$    $\frac{1}{5}$

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

e)  $\frac{1}{2}$    $\frac{5}{8}$

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

f)  $\frac{3}{9}$    $\frac{1}{3}$

(F1, 6 marks)

23 Which fraction is the odd one out?

Explain your answer.

$$\frac{5}{10} \quad \frac{1}{2} \quad \frac{25}{100} \quad \frac{4}{8}$$

(F2, 2 marks)

24 Complete the following statements:

a)  $1\frac{1}{8} = \frac{9}{\quad}$

d)  $\frac{\quad}{4} = 3\frac{3}{4}$

b)  $\frac{6}{5} = 1\frac{\quad}{5}$

e)  $2\frac{1}{5} = \frac{\quad}{\quad}$

c)  $\frac{7}{4} = \frac{\quad}{4}$

f)  $\frac{11}{3} = \frac{\quad}{\quad}$

(F3, 10 marks)



25 Calculate:

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

c)  $\frac{6}{7} - \frac{1}{14} =$

b)  $\frac{4}{5} + \frac{3}{10} =$

d)  $\frac{1}{2} + \frac{1}{4} - \frac{1}{8} =$

(F4, 10 marks)

26 Calculate, writing the answer in its simplest form:

a)  $\frac{1}{4} \times 7 =$

b)  $\frac{2}{3} \times 6 =$

c)  $3\frac{1}{4} \times 4 =$

(F5, 6 marks)

27 Write the decimal equivalent of:

a)  $\frac{9}{100} =$

b)  $\frac{19}{100} =$

c)  $\frac{91}{100} =$

(F6, 3 marks)



28 Write the value of the symbols:

a)  $\frac{9}{\clubsuit} = 0.009$

$\clubsuit = \dots\dots\dots$

b)  $0.19 = \frac{1}{10} + \frac{*}{100}$

$* = \dots\dots\dots$

c)  $0.273 = \frac{\square}{10} + \frac{\Delta}{100} + \frac{\nabla}{\blacksquare}$

$\square = \dots\dots\dots$ ,  $\Delta = \dots\dots\dots$ ,  $\nabla = \dots\dots\dots$ ,  $\blacksquare = \dots\dots\dots$

(F7, 6 marks)

29 a) Round:

i) 1.34 to the nearest whole number: .....

ii) 4.77 to the nearest whole number: .....

iii) 0.78 to the nearest whole number: .....

iv) 14.55 to the nearest whole number: .....

b) Round:

i) 1.34 to one decimal place: .....

ii) 4.77 to one decimal place: .....

iii) 0.78 to one decimal place: .....

iv) 14.55 to one decimal place: .....

(F8, 8 marks)



**30** Place these numbers in order, from smallest to largest:

0.321

0.32

1.231

0.3

1.321

1.23

1.32

--	--	--	--	--	--	--

(F9, 3 marks)

**31** The world record for the men’s 100m set by Usain Bolt on 2009 was 9.58 seconds.

If this time was rounded to two decimal places, what could have been the fastest time to three decimal places?

.....  
(F10, 1 mark)

**32 a)** Complete the following statements about percentages and fractions:

i) 17% = .....

iii) 80% = .....

ii) 4% = .....

iv)  $\frac{7}{100}$  = .....

**b)** Complete the following statements involving percentages and decimals:

i) 35% = .....

iii) 90% = .....

ii) 8% = .....

iv) 0.7 = .....%

(F11, 8 marks)





33 Which is bigger?

Explain your answer

**A**  
50% of £60

**B**  
20% of £200

**C**  
25% of £140

**D**  
75% of £48

(F12, 3 marks)



**34** Are these statements true (T) or false (F)?

- |                                 |                                     |
|---------------------------------|-------------------------------------|
| <b>a)</b> 2.5 km = 250 m .....  | <b>d)</b> 2500 g = 2.5 kg .....     |
| <b>b)</b> 2.5 m = 250 cm .....  | <b>e)</b> 2.5 litres = 250 ml ..... |
| <b>c)</b> 250 mm = 2.5 cm ..... | <b>f)</b> 0.8 litres = 800 ml ..... |

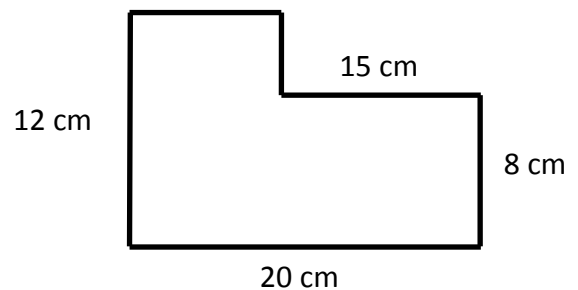
(M1, 6 marks)

**35** Circle the correct answer

- |   |        |         |         |          |
|---|--------|---------|---------|----------|
| <b>a)</b> 1kg is approximately the same as:     | 1 lb   | 2 lb    | 5 lb    | 10 lb    |
| <b>b)</b> 1 inch is approximately the same as:  | 1 cm   | 2.5 cm  | 5 cm    | 10 cm    |
| <b>c)</b> 1 litre is approximately the same as: | 1 pint | 2 pints | 5 pints | 10 pints |

(M2, 3 marks)

**36** Calculate the perimeter of this shape:

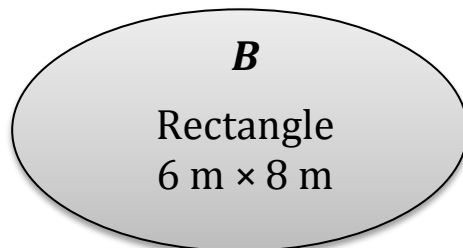
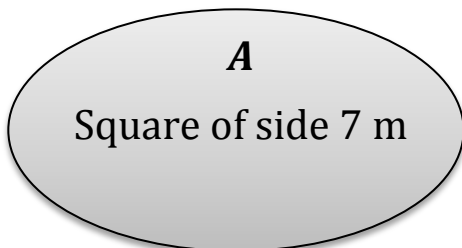


..... cm  
(M3, 2 marks)



37 Which has the greatest area?

Tick the one that does

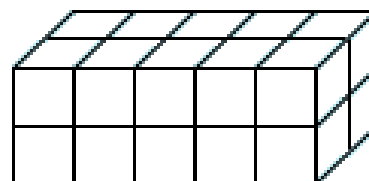


Explain your answer.

(M4, 2 marks)

38 The cuboid is made of  $1\text{cm}^3$  cubes.

Calculate the volume of the cuboid.



.....  $\text{cm}^3$   
(M5, 1 mark)

39 Jack goes on holiday on Monday 6<sup>th</sup> April at 10:15 a.m.

He returns home on Wednesday 26<sup>th</sup> April at 6:30 p.m.

Calculate the duration of his holiday.

..... weeks ..... days ..... hours ..... minutes  
(M6, 4 marks)



**40** A can of paint holds 2.5 litres and costs £9.50.

One can of paints covers  $5\text{m}^2$ .

How much does it cost to paint a wall with dimensions 2 metres by 10 metres?

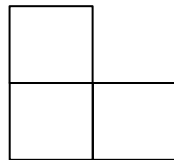
£.....

*(M7, 4 marks)*

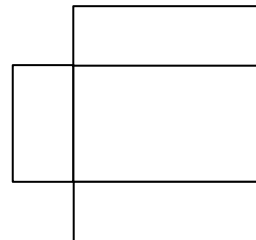


41 Complete the nets of:

a) A cube



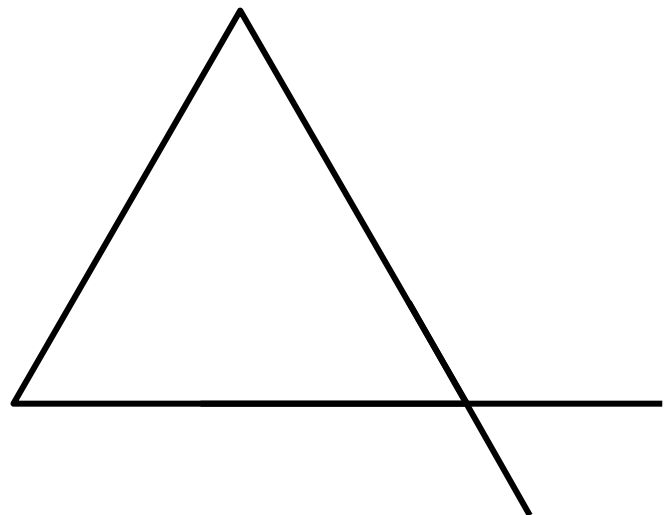
b) A cuboid



(GPS1, 2 marks)

42 Look at the diagram here

- a) Label an acute angle, A.  
Estimate the size in degrees
- b) Label an obtuse angle, O  
Estimate the size in degrees
- c) Label a reflex angle, R  
Estimate the size in degrees



(GPS2, 6 marks)

43 a) Draw, and label, an angle measuring:

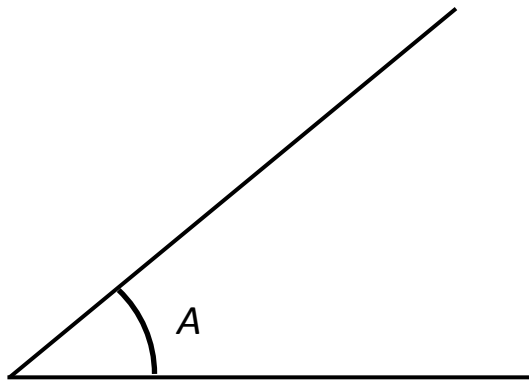
i)  $50^\circ$

ii)  $140^\circ$



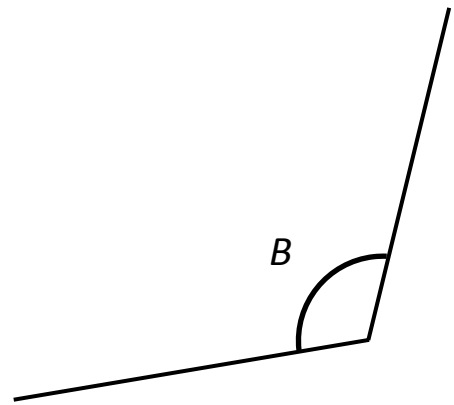
b) Measure the size of angles A and B, to the nearest degree:

i)



.....°

ii)

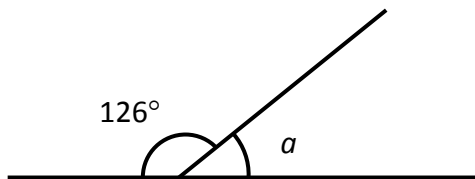


.....°

(GPS3, 4 marks)

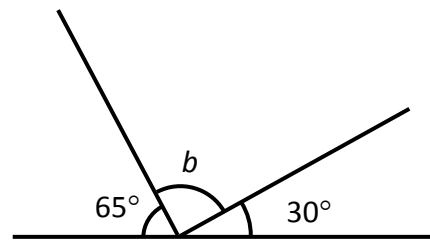
44 Find the value of the missing angle in each diagram

a)



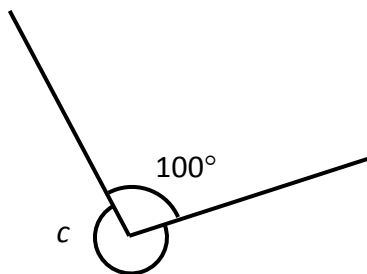
.....°

b)



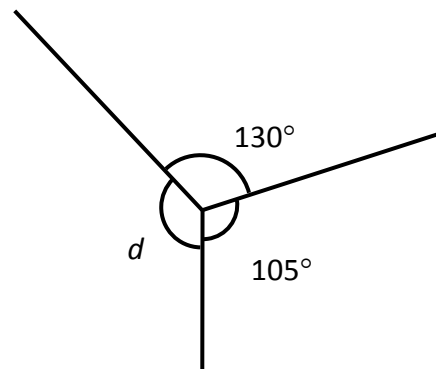
.....°

c)



.....°

d)



.....°

(GPS4, 8 marks)



**45** The perimeter of a rectangle is 50 centimetres.

The width of the rectangle is 12 centimetres.

Calculate the length of the rectangle.

..... cm

*(GPS5, 2 marks)*

**46 a)** Name the type of triangle that is regular. Explain your choice.

.....  
.....  
.....

**b)** Name the type of quadrilateral that is regular. Explain your choice.

.....  
.....  
.....

*(GPS6, 2 marks)*



- 47** Look at the triangle on the grid
- a)** Bob translates the triangle one square to the left and two squares up.

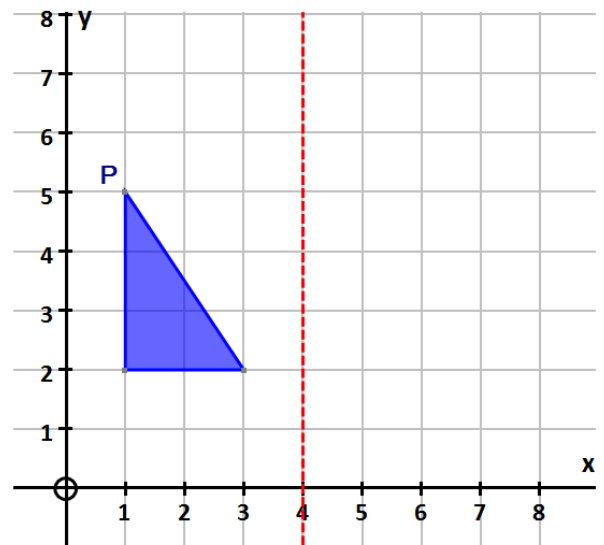
Find the new co-ordinates of the vertices of the triangle.

..... , ..... , .....

- b)** Sally reflects the triangle in the dotted line

Find the new co-ordinates of vertex P.

.....

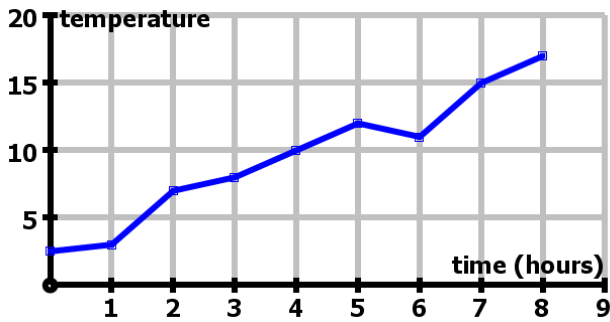


(GPD1, 4 marks)

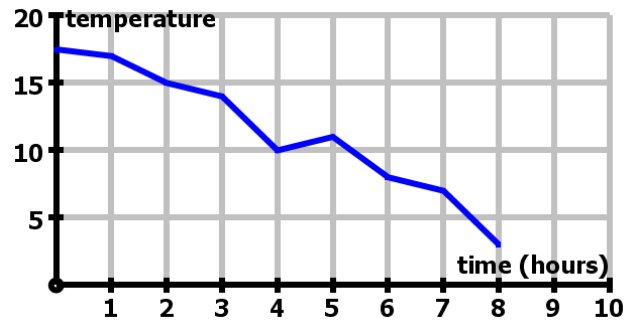




48 The line graphs show the temperature of two cities starting at midnight.



City A



City B

- a) What is the difference in the temperatures at midnight?  
.....
- b) At what time do both cities have the same temperature?  
.....
- c) What is the difference in the temperatures at 8 am?  
.....
- d) After 6 hours, which city has the greatest change in temperature?  
.....  
(S1, 5 marks)

49 Trains from Cheltenham to Malvern are shown in this timetable.

<b>Cheltenham</b>	11:00	11:30	13:15
<b>Ashchurch</b>	11:13		
<b>Twyning</b>	11:25		
<b>Upton</b>	11:37		
<b>Malvern</b>	11:50		

- a) How many trains are there?  
.....
- b) The time between stops is the same for each train. Complete the timetable.
- c) You are in Cheltenham and you need to get to Malvern by 2pm.
  - i) What is the time of the train that you need to catch at Ashchurch?  
.....
  - ii) How long is the journey of a train?  
.....  
(S2, 7 marks)



