



**ELGIN ACADEMY**

**Mathematics Department**

**S1/2 HW (Ext)**



## S1 Upper Homework 1

1. a)  $3 + (-2)$       b)  $-5 + (-6)$       c)  $-10 - (-7)$   
d)  $2 + (-3) - (-8)$



2. Fred had £152 in his bank account and he wrote a cheque for £195. How much does he now have in his bank account?



3. Three vertices (corners) of a kite are at  $(-4, -1)$ ,  $(-1, -4)$  and  $(2, -1)$ . Plot these points and complete the kite.

Write down the coordinates of

- a) the fourth vertex    b) the point where the diagonals meet.



4. Gladys and Bill enjoy playing golf so they bought some second hand sets of golf clubs.

Gladys bought 3 woods at £18 each and 6 irons at £15 each.

Bill bought 4 woods at £16 each and 6 irons at £19 each.

How much did they each spend on their clubs?



5. Write two story questions involving negative numbers.



6. a) Write in words 3 027 000.  
b) Write in figures five million four thousand and nine.



7. a) Add 4.81 to 17.6 and subtract 6.08 from the sum.  
b) Calculate  $14.8 - 2.91 - 8.9 + 0.78$



8. What fraction of the alphabet are a) vowels    b) consonants?



## S1 Upper Homework 2

1. Write down the number which is

- a) 50 more than 2 990                      b) 1 less than 5 000 000  
c) half of 990                                  d) 19 less than 461



2. One lunchtime the school tuck shop sold 82 packets of crisps at 26p per packet, 79 apples at 15p each and 123 bottles of water at 16p per bottle.



How much money altogether was spent at the shop?

3. Last week 37250 fans attended a football match. The total takings at the turnstiles was £307 312.50. What was the average amount paid by each fan?



4. Calculate (but do not use a calculator!)

- a)  $-3 + (-16)$                       b)  $-4 \times -6$                       c)  $-25 \div 5$   
d)  $3 + (-5) - (-4)$                 e)  $-5 \times 5 \times -1$                 f)  $(20 \times -6) \div (-5)$



5. In a block of flats the lift takes 15 seconds to travel between floors.

The lift stops at each floor for 20 seconds. Magda lives on the 25<sup>th</sup> floor. How long will it take, from the moment the lift leaves the ground floor, until it arrives at Magda's floor?



6. ABCD is a square. If A is (4,5), B is (1,2) and C is (4,-1), write down the coordinates of D. Draw a diagram first!



7. A shop assistant earns £6.20 per hour.

How much will he earn if he works  $20\frac{1}{2}$  hours?



8. Share £400 between seven people, correct to the nearest

- a) £1    b) 10p    c) 1p



## S1 Upper Homework 3

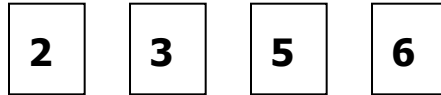
1. Fred is carrying 5 parcels weighing 549g, 1256g, 990g, 1307g and 1073g
- What is the total weight of the parcels?
  - What is the difference in weight between the heaviest and the lightest parcel?
  - Round the weight of each parcel to the nearest 100g.  
What is the total weight?



2. PQR is a triangle. P is the point  $(-3,-2)$ , Q is  $(-3,-6)$  and R is  $(4,-4)$ .
- Move PQR 3 squares down.  
What are the coordinates of the new points?
  - Move PQR 2 squares to the left.  
What are the coordinates of the new points?



3. Two of these cards are placed side by side to make a two digit number (for example 25).



- How many different 2 digit numbers can be made with the cards?  
What is the remainder when the highest number is divided by the lowest number?
- How many different 3 digit numbers can be made with the cards?  
What is the difference between the highest number and the lowest number?
- How many different 4 digit numbers can be made with the cards?  
Find their total.



## S1 Upper Homework 4

1. If  $299 \times 10 = 2990$  calculate

- a)  $299 \times 9$    b)  $299 \times 11$    c)  $299 \times 20$    d)  $299 \times 19$



2. How much larger is  $26 + 29 \times 2$  than  $26 \times 2 + 29$  ?



3. Fred earns £950 per month. How much does he earn in a year?



4. A journey lasts from 14 40 hours until 16 20 hours.  
How long is this?



5. A book has 18 words per line and 43 lines per page.  
There are 487 pages.  
How many words are there in the book?



6. A ball costs £17.49. How much change do you get if you pay  
only with 20p coins.



7. A school minibus has seats for 15 students.

- a) How many trips will it have to make to take 69 students to a  
sports meeting?  
b) How many spare seats would there be?



8. Calculate

a)  $(-8) + (-5) - (-4)$

b)  $7.8 - 10$    c)  $(-4.1) + 7$

d)  $3 \times (-14)$

e)  $(-5) \times (-13.4)$

f)  $(-35) \div (-5)$

g)  $9 + 13 \times 3 - 6$

h)  $4 \times 75 \div 5$

i) half of 99



## S1 Upper Homework 5



1. Round to 1 decimal place.

a) 15.638

b) 0.9341

c) 5.999

2. Round to 2 d.p.

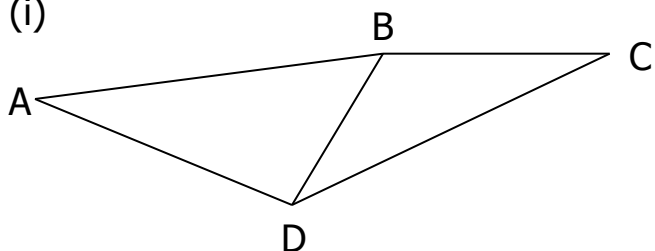
a) 4.638

b) 17.3419


c) 0.0621



3. (i)




Copy the diagram and mark on these symbols.

a)   $\angle$  DBC

b)   $\angle$  ADB

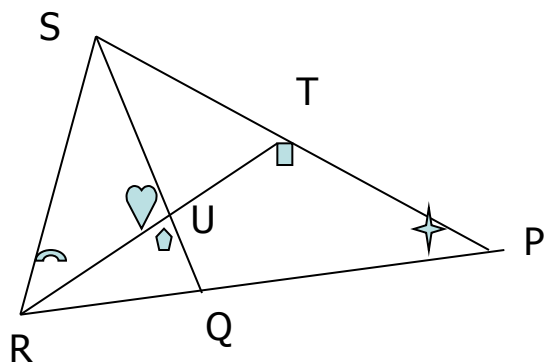
c)   $\angle$  ABC

d)   $\angle$  BCD

e)   $\angle$  BAD



(ii) Name the marked angles.



4. Draw and label axes.

Plot these points : E (1,2), F (-1,2), G (-3,-2), H (-1,-2).

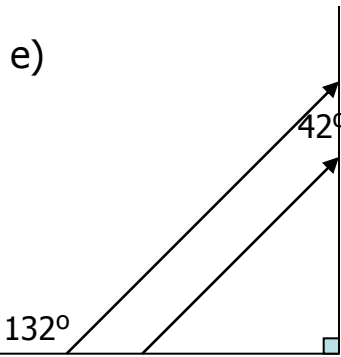
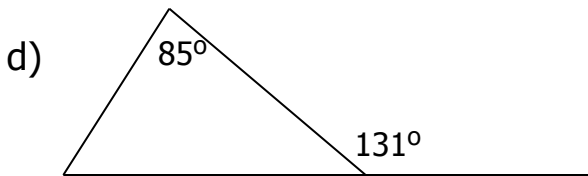
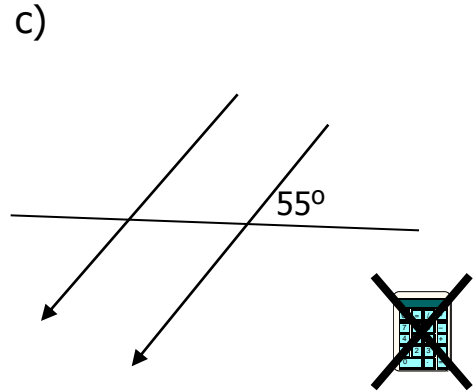
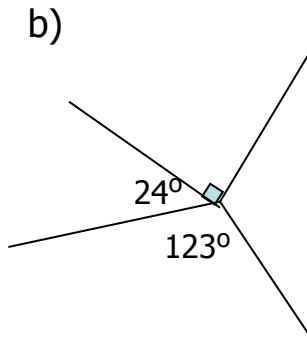
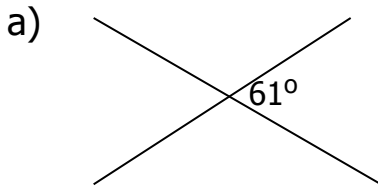
Join the points in order. Name the four-sided shape.

Draw the diagonals. Write down the coordinates of the point where the diagonals meet.



## S1 Upper Homework 6

1. Copy the diagrams and mark on the size of each missing angle. Use a ruler.



2. Jane bought seven T-shirts, one for each of her 7 brothers for \$9.95 each. The cashier charged her an additional \$13.07 in sales tax. She left the store with \$7.28.



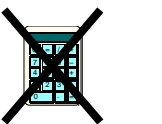
How much money did Jane start with?

3. On the race track, one lap is 12 miles long. On Sunday, they will hold a race of 133 laps. How long is the race in miles?



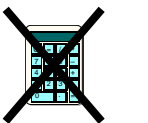
Round your answer to the nearest 100 miles.

4. Write down the a) complement of  $35^\circ$       b) supplement of  $49^\circ$



5. Find the Mystery Number. Show working.

The mystery number has 2 digits and is less than 60. The number is a multiple of 4 and the sum of its digits is 5.



## S1 Upper Homework 7

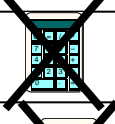
1. Write down the bearing of  
a) North West      b) South      c) South East



2. Sketch these bearings.  
a)  $045^\circ$       b)  $210^\circ$       c)  $160^\circ$       d)  $300^\circ$



3. Add 0.0001 and 5.939999



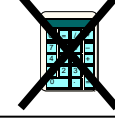
4. How much does a box of two hundred 43p stamps cost?



5. These calculations give the same answer:  
 $923 - 65$  and  $N - 100$ . What is the value of N?



6. Find 3 consecutive numbers whose sum is 147.



7. A farmer grows 252 kg of apples. He sells them to a grocer who divides them into 5kg and 2kg bags. If the grocer uses the same number of 5kg bags as 2kg bags, then how many bags did he use altogether?



8. Little Lucy is only 4 weeks old. How many minutes old is she?



9. Newspapers are printed on big printing presses. One of these presses produces 500 copies each minute.



- a) How many copies will one of these presses produce in  $4\frac{1}{2}$  hours?  
b) The newspaper management want to print 2.4 million copies in 4 hours. They do so by having several presses running at once. How many presses do they need?



# S1 Upper Homework 8

Show all working.

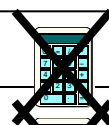
1. a)  $3.7 + 7 - 5.69$     b)  $45 - 17.76$     c)  $3.69 \times 8$   
d)  $2583 \div 7$     e)  $76 - 54 + 129$     f)  $4.8 - 7.95 + 12.8$   
g)  $13 - 6 \times 4 + 5$     h)  $362 \div 20$     i)  $37 \times 93$



2. a) Find the HCF of 24, 40 and 72  
b) Find the LCM of 8, 12 and 20



3. Write as a product of prime numbers a) 24    b) 30    c) 54



4. The bells at two schools ring on different schedules.

One bell rings every 45 minutes, the other every 60 minutes.

If both bells ring at 8.45am, what time will it be when both bells ring again at the same time?



5. Using only the numbers 2, 3, 4, 6 and 10, make the number at the end.

You may use only these numbers and no number may be used more than once.

eg  $(\square + \square) \times (\square - \square) = 70$  becomes  $(4 + 6) \times (10 - 3) = 70$

- a)  $(\square + \square) \div (\square - \square) = 4$     b)  $(\square + \square) \div (\square - \square) = 8$   
c)  $(\square - \square) \times (\square + \square) = 24$     d)  $(\square \times \square) + (\square \div \square) = 14.5$



6. A 800 seat multiplex is divided into three theatres. There are 270 seats in Theatre 1 and there are 150 more seats in Theatre 2 than in Theatre 3.

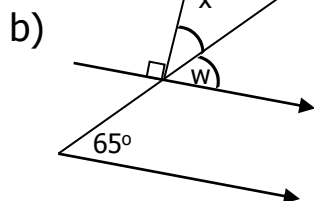
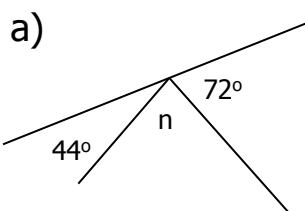
How many seats are there in Theatre 3?



7. Fred has a pet Kudu named Cucumber. Cucumber loves kumquats and consumes 58 per day. How many kumquats will Cucumber eat in a year?

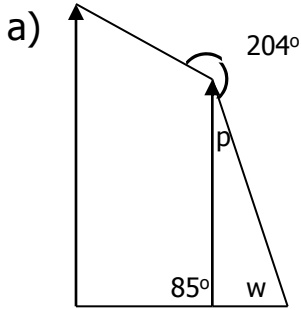


8. Calculate the size of the missing angles.



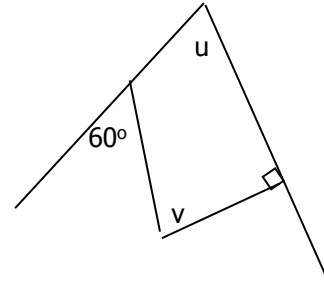
## S1 Upper Homework 9

1. Calculate the size of the missing angles.



b) Angle  $v$  is twice as big as angle  $u$ .

Find the size of  $u$  and  $v$ .



2. Two window cleaners' ladders are 3.78 m and 4.56 m long.

a) What is the difference between these lengths?

b) Find the total lengths of the two ladders.



3. a) Find the Lowest Common Multiple of 4, 5 and 6.

b) Find the Highest Common Factor of 88, 20 and 7

c) Express 36 as a product of prime factors.



4. The table shows the average daily maximum temperature in January in some capital cities.

a) How many degrees warmer is Asuncion than Ulan Bator?

b) What is the difference in temperature between London and (i) Asuncion (ii) Nicosia (iii) Moscow (iv) Ulan Bator?

c) Compare Ulan Bator's July temperature of  $21.6^\circ$  with its Jan temperature.

City	Temperature ( $^\circ\text{C}$ )
Asuncion	35
London	6.3
Ulan Bator	-18.8
Moscow	-9.3
Nicosia	14.9



5. A cardboard box weighs 350g. When filled with 24 cans of cola it weighs 11.15 kg. Calculate the weight of one can in

a) kilograms. b) grams.



## S1 Upper Homework 10

1. Calculate, showing all working  
a) 70% of 85 kg    b) 30% of \$29.20    c) 4% of 386 cm



2. Calculate.

a)  $(-6) \times (-2)$     b)  $25 \div (-5)$     c)  $4 - 9 + 6 - (-12) + (-4)$



3. Change to mixed numbers.

a)  $\frac{69}{3}$     b)  $\frac{74}{6}$     c)  $\frac{186}{5}$     d)  $\frac{214}{4}$     e)  $\frac{410}{3}$



4. Here is a recipe for purple paint. Mix blue and red in the ratio  
3 to 1.

- a) How many tins of blue do you need to mix with 5 tins of red?  
b) How many tins of red go with 6 tins of blue?



5. A small boat has length 9 metres and width 3 metres.

- a) What is the ratio of its length to its width?  
b) What is the ratio of its width to its length?



6. Ted, Ned and Zed are salesmen. They all call into the office on the  
first day of every month for a meeting.

After this, Ted comes in every second day, Ned comes in every third  
day and Zed comes in every fourth day.

How many days in August will all three be together in the office?



7. Mrs Brown bought three steaks at the butcher's.

Their total weight was 4.67 pounds.

If the large steaks weighed 1.56 pounds and 1.83 pounds,  
find the weight of the smallest steak.



8. During a lab experiment a liquid's temperature is recorded at each  
stage of the experiment. The temperature is raised by  $8^{\circ}\text{C}$  then  
dropped by  $15^{\circ}\text{C}$  then dropped by a further  $4^{\circ}\text{C}$ . If the initial  
temperature was  $3^{\circ}\text{C}$ , what was the final temperature?



## S1 Upper Homework 11

1. Calculate, showing working. a) 27% of 87 cm    b) 3% of \$49



2. Arrange in order, smallest first : 36%,  $\frac{19}{50}$ , 0.35,  $\frac{74}{200}$



3. Which is greater? 72% of £36 or 36% of £72



4. A petrol lawnmower bought for £180 in 2007 has depreciated in value over the last few years.



It is now worth 84% **less** than its original value.

What is the mower worth today?

5. Two opposite vertices (corners) of a rectangle are at (-4,1) and (2,-3).



a) By drawing the diagram, find the coordinates of the other two vertices.

b) Find (i) the area (ii) the perimeter of the rectangle.

6. A box holds 500 sheets of paper.



How many boxes are needed for 10 000 sheets?

7. For her shop, Sharon bought 36 tins of beef stew for £20.16.



She sold each tin for 65p.

How much profit did she make if she sold all the tins?

8. Here is recipe for brown paint. Mix black and red in the ratio 2 : 7.



a) How many tins of red do you need to mix with 14 tins of black?

b) How much brown paint does this make?

c) How many tins of black do you need to mix with 14 tins of red?

d) How much brown paint does this make?

e) How could you make 36 tins of brown paint?

## S1 Upper Homework 12a)

1. Work out

- a)  $16 + (-17)$       b)  $-21 + 13$       c)  $0 - (-5)$       d)  $-90 - (-10)$   
e)  $-5 + (-2.5)$       f)  $10 - 12.7$       g)  $-1.5 - 6.2$



2. How long is it between these times?

- a) 0915 to 1325      b) 0840 to 1235      c) 9.25am to 6.40pm  
d) 3.35pm to 8.15am



3. Give the time in either 12- or 24-time as indicated in the question.

- a) 3 hours before 7.15am      b)  $5\frac{1}{2}$  hours after 0715  
c) 5 h 25 min after 1455      d) 13h 20 min before 11.05pm



4. An antique clock cost £540. Its price increased by 34% in a year.  
What is it now worth?



4. The purchase price of a car was £10,000. It was sold two years later for £8,500.  
What was the loss as a percentage of the original price?



7. Order the following fractions from biggest to smallest.

$$\frac{1}{4} \quad \frac{2}{3} \quad \frac{3}{4} \quad \frac{7}{12}$$



8. One evening the temperature was  $-3^{\circ}\text{C}$  and during the night it fell to  $-14^{\circ}\text{C}$ .  
By how many degrees had the temperature fallen?



9. Twenty sheets of plastic cost £84. Find the cost of 38 sheets.



10. Calculate, showing working.

- a) 42% of 362 kg      b)  $\frac{3}{11}$  of 132 cm      c)  $65 \times 47$



## S1 Upper Homework 12b)

1. Write down the a) complement of  $35^\circ$     b) supplement of  $49^\circ$



2. Find the Mystery Number. Show working.

The mystery number has 2 digits and is less than 60. The number is a multiple of 4 and the sum of its digits is 5.



3. a) Find the Lowest Common Multiple of 4, 5 and 6.

b) Find the Highest Common Factor of 88, 20 and 7

c) Express 36 as a product of prime factors.



4. A rare vase bought for £80 some years ago has now been valued at £440!!!

Calculate the appreciation as a percentage of the buying price.

5. Calculate these time differences.

a) 9.30 am – 11.45 am    b) 1105 – 1750    c) 0643 – 20.27



6. A comet travels at 783 miles an hour. How far can it travel in  $2\frac{3}{4}$  days?

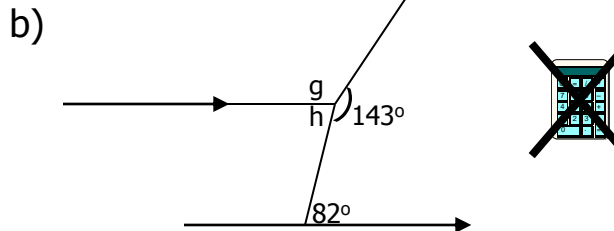
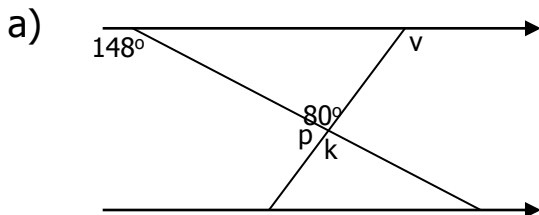


7. John cycles 15km in 25 minutes, and then walks 3km in 50 minutes.

Calculate his average speed, in km/h, from start to finish.



8. Calculate the size of the marked angles.



9. Calculate the time taken (in hours and minutes) to :

a) drive 120 km at 80 km/h    b) walk 46 miles at 5 mph

c) cruise 200 miles at 30 mph



# S1 Upper Homework 13

1. The Mystery Number is a two digit prime number greater than 50.  
The sum of its digits is 10 and the difference between the digits is 4.  
Find the number. Show working.



2. Show working

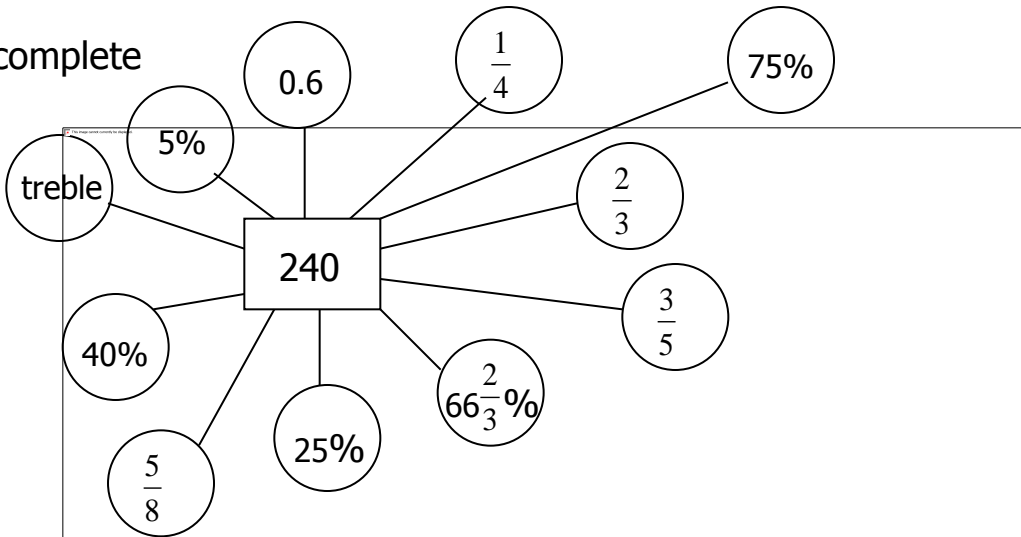
- a)  $584 + 23 - 186$    b)  $2000 - 1636$    c)  $385 \times 37$    d)  $7686 \div 9$



3. **Sketch** bearings of a)  $065^\circ$    b)  $310^\circ$    c)  $125^\circ$    d)  $245^\circ$



4. Copy and complete



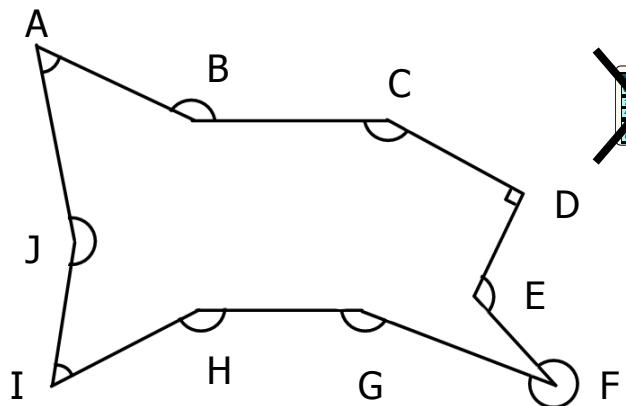
5. Out of the following angles there are 3 pairs of complementary angles and 3 pairs of supplementary angles. Can you find them?

- |     |    |    |    |    |     |     |     |
|-----|----|----|----|----|-----|-----|-----|
| 166 | 79 | 34 | 14 | 10 | 9   | 121 | 171 |
| 73  | 56 | 44 | 59 | 42 | 100 | 81  | 17  |



6. Using **3** letters for each angle, name

- the right angle
- the acute angles
- the obtuse angles
- the reflex angles



# S1 Upper Homework 14

## 1. Chocolate Mousse

for 2 people

100g chocolate

10g butter

2 eggs

I have 8 eggs, 45 g butter and 350g chocolate.

What is the maximum number of people I can make chocolate mousse for?

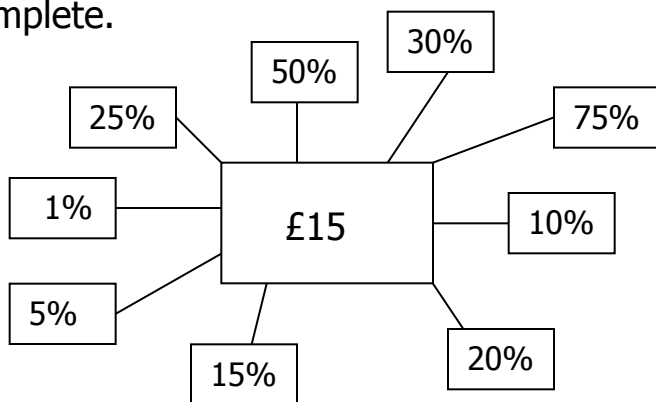


2. A block of 30 identical wooden blocks is 4.5m tall.

What is the distance from the top of the 16<sup>th</sup> block to the bottom of the 24<sup>th</sup> block?



3. Copy and complete.



4. Round 29 639 to the nearest a) thousand b) hundred c) ten d) unit

5. Calculate, showing working.

a)  $27 - 5 \times 3$

b)  $22.2 \div (3.1 + 8)$

c)  $(9 - 3 \times 2)^2 \div (18 \div 6)$

d)  $9^2 + 4^2 + (4 - 2)^2 - 1$

e)  $1050 - (12 - 2)^3$



6. Calculate (but do not use a calculator!)

a) 50% of £390

b) 25% of 463

c)  $33\frac{1}{3}\%$  of 158.4 m

d) 60% of 5.8km

e) 3% of £287

f) 15% of 46 cm



7. Rewrite in order, smallest first.

0.61

$\frac{15}{75}$

$\frac{32}{50}$

42%



8. Write 12 as a product of prime factors





## S1 Upper Homework 15

1. Write these fractions as decimals correct to 2 decimal places

a)  $\frac{2}{7}$       b)  $\frac{1}{3}$       c)  $\frac{4}{11}$



2. Simplify:

a)  $b \times b$       b)  $4 \times f \times g$       c)  $c \times c \times d$       d)  $a + a + a + a$   
e)  $5x + 3y - 2x - y$       f)  $xy + 2y + 3xy + 4y$       g)  $4b + 4c - 3b + 2a - 3c$



3. Insert  $<$  and  $>$  between the following pairs of numbers:

a) 0   3      b) -3   0      c) -4   -5      d) -123   345      e) -7   -6



4. Find:

a)  $\frac{7}{10}$  of £16.30      b)  $\frac{2}{3}$  of £21.75      c)  $\frac{19}{20}$  of 91 litres



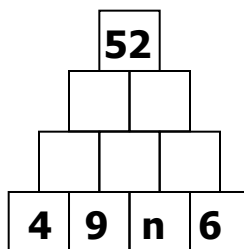
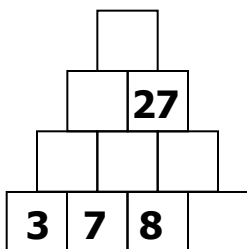
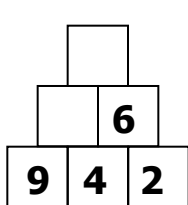
5. A train has to make a journey of 200 km.

How fast would it need to travel to complete the journey in :

a) 2 h      b) 4 h      c) 5h      d) 30 min?



6. In these triangles each number is found by adding the two numbers underneath it. Copy and complete these triangles.



Find the value of n in this triangle.

7. A lorry weighs 3.425 tonnes.

What is the total weight of 30 of these lorries?



8. How long will it take for a car to travel 157.5 miles at 70mph



9. Simplify  $\frac{5 \times 32}{8}$



## S1 Upper Homework 16

1. If  $a = 1$ ,  $b = 2$  and  $c = 4$ , evaluate

a)  $a + b + c$

b)  $abc$

c)  $2a - 3b$

d)  $b^2 - 3c$

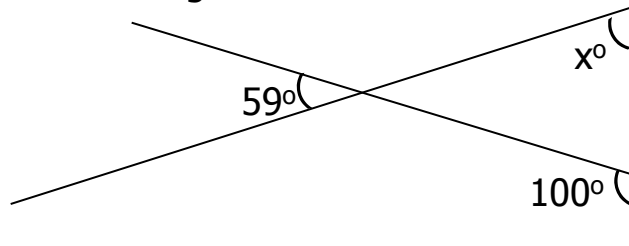
e)  $5(2a - c)$

f)  $b - 3a + 2c^2$

g)  $\frac{5b+2c}{3a}$



2. Calculate the size of angle marked  $x$ .



3. Ann sat tests in 4 different subjects.

In which 2 subjects did she perform equally well?

Maths  $\frac{32}{40}$

English  $\frac{37}{50}$

Science  $\frac{13}{20}$

Computing  $\frac{20}{25}$



4. A spaceship travels at 3 000 km/h.

How far will it travel in a day?



5. How far will Ellie jog at 14km/h if she runs for 45 minutes?



6. A school orders 7 new computer chairs at a total cost of £394.10.

Later, an additional 5 chairs are ordered.

How much will the school pay for the 5 additional chairs, at the same price?



7. Simplify  $12g^2 + 8h + 4g - 10g^2 + 5h - g$



8. Four bags of sugar are weighed as part of a quality control process.

Their total weight is 4.038 kg.

Bag 1 weighs 1.1 kg

Bag 2 weighs 0.986 kg

Bag 3 weighs 1.09 kg

What is the weight of the 4<sup>th</sup> bag?

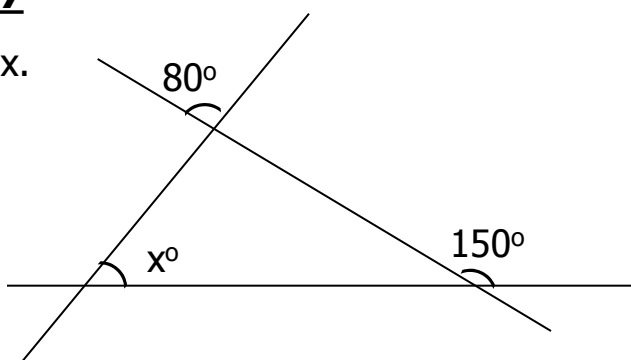
9. A bus journey takes 2 hours 24 minutes. The distance travelled is 132 miles.

Find the average speed for the journey.



## S1 Upper Homework 17

1. Calculate the value of  $x$ .



2. Calculate

a)  $-5 + 3$

b)  $-8 - 5$

c)  $-8 + (-9)$

d)  $-13 - (-12)$

e)  $14 + (-29)$

f)  $-15 - (-50)$

g)  $10 \times (10-15)$

h)  $(-3)^2$

i)  $((-4) - 11) \div 3$

j)  $((-10) + 4) \div 3$



3. A group of 70 teachers won the National Lottery Jackpot.

They each received an equal share of the £849767.50 prize money.

How much did each teacher receive?



4. 54 pupils out of a year group of 180 pupils walk to school in the morning.

Express this as a percentage.



5. Round to the number of decimal places given in brackets.

a) 16.468 (2dp)

b) 14.892 (2dp)

c) 5.726 (1dp)



6. Thirty thousand football fans each paid £23.50 for a ticket for the Cup Final.

How much money is this altogether?



7. Jamie walked 900 metres in 8 minutes.

Calculate his average speed in metres per minute.



8. Write down all the ways in which 24 can be written as a product of 2 factors.



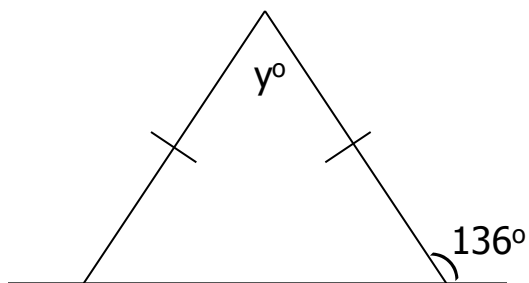
9. A rectangle has an area of  $15 \text{ cm}^2$ . Each of its sides is doubled in length.

What is the area, in  $\text{cm}^2$ , of the enlarged rectangle?



## S1 Upper Homework 18

1. Calculate the size of angle  $y$



2. In a game, players get points by winning planes, trains and buses.

A plane = 10 points, a train = 5 points and a bus = 2 points.

John has earned 29 points as shown in the table below.

Plane	Train	Bus	Total
(10 pt)	(5 pt)	(2 pt)	
1	3	2	29

Complete the table showing 5 more different ways to earn 29 points.



3. A horseman rides 20 km in 1h 15 minutes.

Calculate his average speed in km per hour.



4. A ball-pool in a children's play area holds 2700 red, yellow and blue balls.

There are 900 red balls. There are twice as many yellow balls as blue balls.

How many yellow balls are there?



5. a)  $40 - 16.8$       b)  $8^3$       c)  $3.78 + 12 + 0.45$       d)  $5.98 \times 40$

e)  $1380 \div 600$       f)  $5.9 + 2.8 \times 3$       g)  $34 \times 98$



6. Simplify

a)  $5x + y - 4x + 4y$       b)  $7d + 2(2d - 4t) - 3(5t - 2d)$



7. Evaluate a)  $3^5 \div 5^3$       b)  $2.8 + \frac{3}{4}$  of 9.6      c)  $\frac{1.7 \times 3.6}{5.7 \div 0.19}$



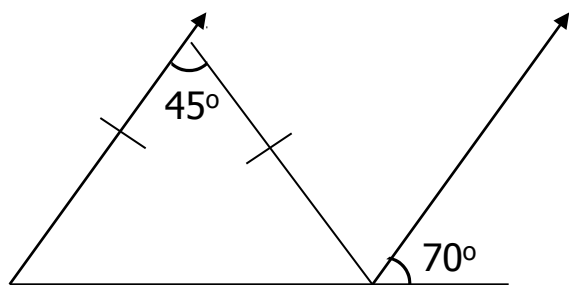
8. If  $a = -2$ ,  $b = 0.7$  and  $c = \frac{1}{2}$ , evaluate

a)  $4a + 2b$       b)  $3c^2$       c)  $abc$       d)  $b - a + c$



## S1 Upper Homework 19

1. Copy this diagram and find the sizes of all the angles.



2. A tractor bought for £25 000 in 2006 has depreciated in value over the past few years. It is now worth 32% less than the original price.



What is the tractor worth today?

3. Remove brackets and simplify.

a)  $2m(4m - 3)$       b)  $-p(2x - 3y + 2)$       c)  $3(y + 4) - 4(3y - 5)$   
d)  $7q - 4(6 - 2q)$



4. A colouring pencil costs £0.09.

What is the cost of    a) 8 pencils    b) 300 pencils    c) 560 pencils



5. Find the highest common factor of 12 and 20.



6. At a children's party, the ratio of boys to girls is 2:3.

What is the ratio of

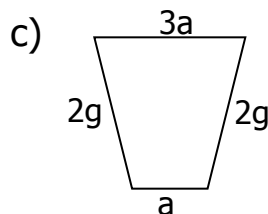
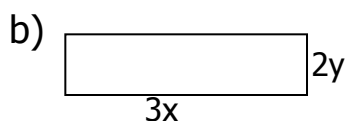
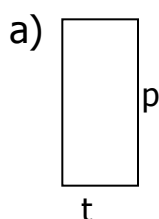
a) girls : boys    b) boys : children    c) children : girls?



7. Five pizzas cost £27.50. Find the cost of 8 pizzas.



8. Write down a formula for the perimeter of each of the following.



## S1 Upper Homework 20

1. Calculate

a)  $10 \times (10 - 15)$

b)  $((-4) - 11) \div 3$

c)  $((-10) + 4) \div (-3)$

d)  $(-4)^3$

e)  $83 - 2.35 \times 16$

f)  $(5 - 13) \div 0.2$



2. If  $a =$  ,  $b = 6$  and  $c = -3$ , find the value of

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

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

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

d)  $\frac{2}{3}b + \frac{2}{3}c$

e)  $\frac{1}{2}(a - b)$

f)  $\frac{b+c}{3}$

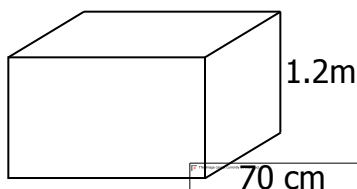
g)  $\frac{3a+b}{5}$

h)  $\frac{a+c+1}{5}$

i)  $\frac{2}{3}b + \frac{2}{3}c$



3. a) Calculate the volume of this tank in  $\text{cm}^3$



b) How many litres will it hold when full?



4. A square has an area of  $60\text{m}^2$ .

$$8 = \frac{2k}{5}$$

Calculate the length of one of its sides (to 2sf) and find its perimeter.



5. a) Plot  $(2, -1)$  and  $(-1, -3)$ .

When these points are joined they form 1 side of a square.

Write down the coordinates of the other 2 vertices.

b) The points  $(-7, -1)$ ,  $(-4, 2)$  and  $(2, 2)$  are 3 vertices of a parallelogram.

Write down the coordinates of the 4th vertex.



6. Calculate a)  $2\frac{3}{7} + 5\frac{1}{9}$

b)  $6\frac{1}{3} - 2\frac{3}{4}$

c)  $3\frac{1}{2} + 4\frac{2}{7} - 1\frac{1}{28}$



7. Solve, showing all working

a)  $4x = 20$

b)  $y - 3 = 12$

c)  $2w + 5 = 19$

d)  $14 = 5f - 1$

e)  $4w - 1 = 3w + 5$

f)  $2q - 5 = 5q + 7$

g)  $\frac{c}{7} = 2$

h)  $8 = \frac{2k}{5}$

i)  $3(2a - 6) = 18$



## S1 Upper Homework 21

1. Multiply out the brackets and simplify:

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

b)  $3ef(7e + f) - (e + 5f) + ef$

c)  $b - 5(a + 6b) - 25b$

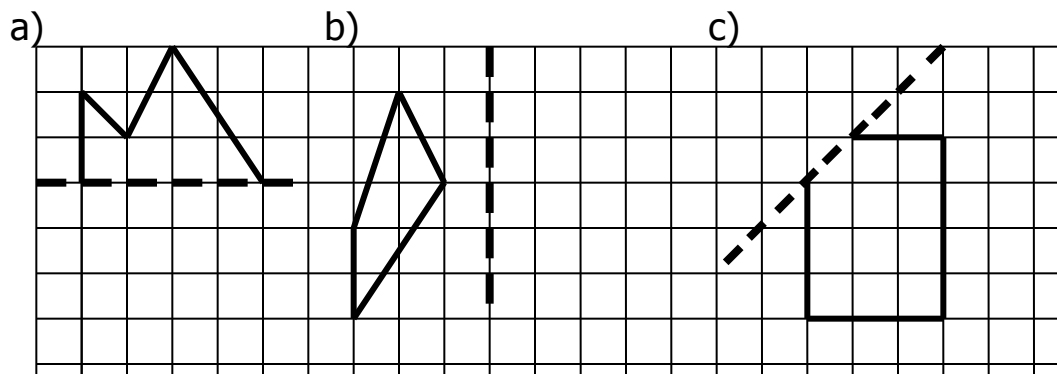
d)  $3t + 6t(3t - 5) - 4t(5 - 8t)$



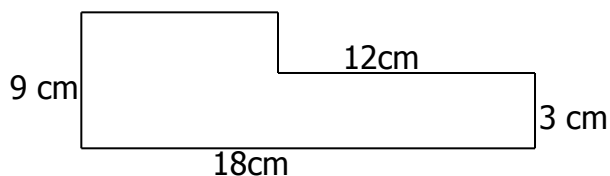
2. Which number is larger :  $3^6$  or  $6^3$ ?



3. Reflect each shape in the dotted line.



4. Make this one third of its size.



5. Write down two more terms for these sequences and give the rule you use.

a) 3, 10, 17, 24, ...

b) 80, 71, 62, 53, ...

c) 1, 3, 9, 27, ...

e) 1, 4, 9, 16, ...

f) 1, 1, 2, 3, 5, ...



6. a) A plane journeys 4 800 km across the Atlantic in 8 hours.

Calculate its average speed.

b) A cyclist averages 30km/h in a race.

How long will it take him to cover 126km?

Answer in hours and minutes.

c) A plane's average speed is 360 km/h.

How far did it travel in 3 hours 18 minutes?



## S1 Upper Homework 22

1. Work out

- a)  $57.2 - 8.98$       b)  $34.1 - 15.02 + 7.287$       c)  $9 \times (-2.6)$   
d)  $(-0.8) \times (-30)$       e)  $(-4.5) \div (-300)$       f)  $5.2 \times 6000$



2. A music jingle on the radio lasted  $14\frac{1}{2}$  seconds.

A new jingle lasts  $1\frac{1}{4}$  times as long.

For how long does the new jingle last?



3. The area of a rectangle is  $8\frac{1}{5}$  cm<sup>2</sup>. Its breadth is  $2\frac{1}{4}$  cm.

Calculate its length.



4. From a weekly wage of £280, I pay £67.20 in rent.

What percentage of my wage goes on rent?



5. Fred's annual golf fees have increased by 18% this year.

He paid £650. Calculate his fees for this year.



6. Solve

- a)  $5a - 6 = 7 - 4a$       b)  $4(d - 6) = 2$       c)  $3k = 12 - k$   
d)  $\frac{4f}{5} = -3$       e)  $4t + 5 = 2 + 7t$       f)  $6(q - 2) = 30$



7. A is the point (2,-3) and C(4,-1).

AC is a diagonal of the kite ABCD.

Draw the kite and write down the coordinates of B and D.

(There are several correct solutions. Give only one.)



8. If  $x = -3$  and  $y = 0.5$ , find the value of

- a)  $x + 2y$       b)  $x^2 - y + (-5x)$       c)  $-(y)^2$



9. It was estimated that 74 million insects descended on a forest containing 12 000 trees. How many insects landed on each tree?

Give your answer correct to 3 sf.





## S2 Upper Homework 1

1. Calculate

(a)  $2.17 + 5.6 - 1.18$

(b)  $16 - 9.2 + 203$

2. Calculate

(a)  $100 - 20 \times (-3)$

(c)  $13.2 + 6.8 \times 20$

(b)  $16 + 8 \div (-4)$

(d)  $14 \times (3.8 + 8.2)$

3.(a) Draw a coordinate diagram. Both axes should go from -5 to 5.

(b) Plot the points A (-1, 3), B (5, -1) and C (3, -4).

(c) Plot a fourth point D so that ABCD is rectangle.

(d) Write down the coordinates of D.

4. Solve to find the value of

(a)  $6x + 1 = 3$        $x$

(c)  $3(4 + 2x) = 36$

(b)  $5x - 14 = 25 + 2x$

(d)  $8x + 4 < 22$

5. Simplify

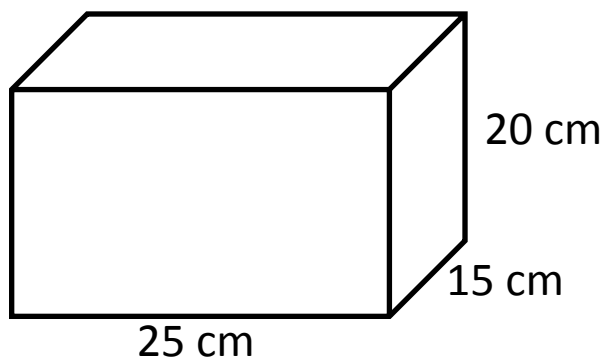
(a)  $2(11 + 3y) - 6$

(c)  $4x(x + 2) + 3x$

(b)  $8(3x - 1) - 5$

(d)  $3 + 7(a - 1) - 9a$

6.(a) Find the volume of the cuboid.



(b) How many litres of liquid are needed to fill the box?

## S2 Upper Homework 2

1. Lucy worked out the price of a single piece of fruit at her supermarket.

orange 18p                  apple 24p                  banana 16p  
pear 22p                  strawberry 4p

Find these price ratios in their simplest form.

- a) apple : orange                  b) banana : pear                  c) strawberry : banana  
d) orange : banana                  e) pear : strawberry



2. Solve

- a)  $y + 6 > 9$                   b)  $a + 10 \geq 5$                   c)  $2w \leq 16$                   d)  $\frac{d}{5} + 2 = 4$   
e)  $15 < 3g$                   f)  $19 < 3r + 4$                   g)  $-12 \geq p - 7$                   h)  $24 \leq -6t$



3. Calculate, showing all working.

- a)  $2.3 - 4.6 + 7.5$                   b) 60% of 65 km                  c)  $0.36 \times 40$   
d)  $61.26 \div 6$                   e)  $\frac{5}{8}$  of £12.16                  f)  $3.75 \div 0.5$



4. Work out

- a)  $4^3$                   b)  $2^5$                   c)  $5^3$                   d)  $7^2$                   e)  $10^4$                   f)  $\sqrt{9}$                   g)  $\sqrt[3]{8}$   
h)  $\sqrt[5]{100\ 000}$                   i)  $\sqrt[4]{81}$                   j)  $\sqrt[3]{125}$                   k)  $\sqrt[4]{256}$



5. a) The train from Aye to Bee takes 25 minutes.

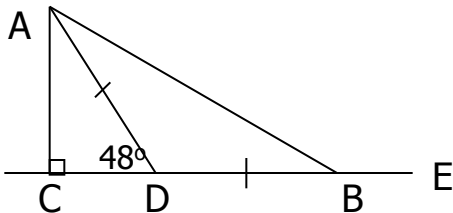
If the distance between the stations is 15km, find the average speed of the train. (In km/h.)



b) How long will a plane take to cover 1040 miles at a speed of 320mph?  
(Answer in hours and minutes.)

6. Calculate the size of each angle.    a)  $\angle CAD$                   b)  $\angle DAB$                   c)  $\angle ADB$

d)  $\angle DBA$                   e)  $\angle ABE$



A

## S2 Upper Homework 3

1. Calculate the circumference of a circle with  
a) diameter 4.3 cm                      b) radius 7.9 m  
Leave your answers correct to 2sf.



2. Calculate, showing all working.  
a)  $3.9 \times 600$                       b)  $392 \div 70$                       c)  $2.9 - 5.6 + 9.35$   
d) 40% of \$429                      e) 6% of 28 km                      f)  $\frac{3}{4}$  of 965 cm



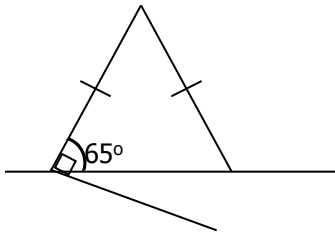
3. Remove brackets and simplify where necessary.  
a)  $3(9t - 5)$                       b)  $8 + 5(w - 6) + w$                       c)  $4 - 7(2 - 3q) + 9$



4. Solve, showing all working.  
a)  $7y = 56$                       b)  $c - 8 = 9$                       c)  $4w + 5 = 37$   
d)  $6y = 5 + 3y$                       e)  $2a - 5 = a + 7$                       f)  $2t - 8 = 3 + 4t$



5. Make a neat sketch and insert the sizes of all angles.



6. Write as hours and minutes.  
a) 185 minutes                      b) 3.5 hours                      c) 2.3 hours  
d) 0.45 hours                      e) 7 200 seconds



7. Calculate, showing all working.

a)  $1\frac{2}{5} + 2\frac{4}{5}$                       b)  $6\frac{3}{7} - 2\frac{1}{2}$                       c)  $1\frac{1}{4} \times 2\frac{1}{2}$                       d)  $3\frac{2}{5} \div 1\frac{2}{3}$



## S2 Upper Homework 4

- A bicycle wheel has a diameter of 53 cm.
  - How far will the bike travel if it rotates 500 times?  
Give your answer correct to the nearest m.
  - How many times must the wheel rotate if it is to cover 700 m?
- In a competition you have to turn 5 cards and add up the numbers.  
The person with the lowest total wins.  
Work out each person's total and decide who won.



Tom 

5	-3	-5	1	4
---	----	----	---	---

Fred 

-1	-6	0	2	-3
----	----	---	---	----

Ann 

-3	9	5	-2	-1
----	---	---	----	----

Gladys 

7	-6	2	0	-5
---	----	---	---	----



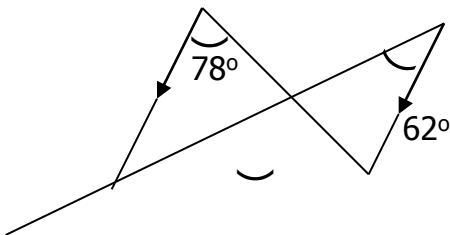
- Solve, showing all working.
  - $3y + 7 = 6y + 1$
  - $6 - 4a = 2a + 8$
  - $2w + 1 = 3 - w$



- Calculate, showing all working.
  - $4.7 \times 700$
  - $36 \times 85$
  - $12.8 \div 4000$
  - 2% of \$532



- Make a neat sketch and insert the sizes of all angles.



- Write as a **decimal** fraction of an hour.
  - 45 minutes
  - 12 minutes
  - 2 minutes

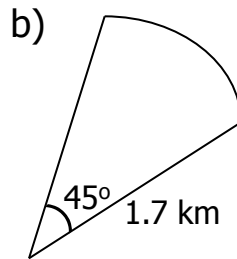
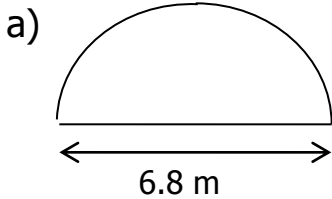


## S2 Upper Homework 5

1. Calculate the area of a circle with  
a) radius 2.6 cm    b) diameter 15.5 km



2. Calculate the perimeter of these sectors.



3. Calculate showing all working.

- a) 40% of £28.90                      b) 8% of 345 metres  
c)  $2.9 - 6.71 + 3.86$                   d)  $4.8 \times 2.4$



4. Round to 2sf.

- a) 2567                                      b) 106.33                                      c) 0.006432



5. Solve showing all working.

- a)  $2x > 14$                               b)  $3a < 2a + 6$                               c)  $5q + 6 > 10q - 3$



6. Change

- a) 5 litres to ml                      b)  $\frac{1}{4}$  litres to ml                      c)  $500\text{cm}^3$  to litres  
d)  $2\frac{1}{4}$  litres to  $\text{cm}^3$                       e) 25 ml to litres



7. a)  $(-4) \times (-3)$     b)  $(-5) + (-8) \div (-2)$     c)  $(-7) \times 5 - 4 \times (-6)$



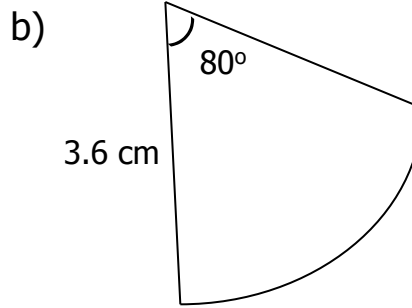
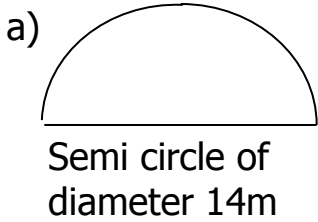
8. A boy takes 150 steps to cover a distance of 120 m.

How far would he walk after 250 steps?



## S2 Upper Homework 6

1. Calculate (i) the area and (ii) the perimeter of these shapes.



2. Solve, showing all working.

a)  $5a + 7 = 2a - 9$

b)  $3(2d - 7) = 5(2 - 6d)$

c)  $2 - 6(e + 3) = 4 - (7 - 3e)$

d)  $\frac{x}{9} = 7$

e)  $\frac{3g}{5} = 8$

f)  $6 + \frac{2a}{5} = 4$



3. What number is halfway between

a) 5.6 and 5.7

b) 3.84 and 3.85

c) 2.761 and 2.762?



4. Polly the parrot was bought for £80 and sold for £90.

Express the profit as a percentage of the original cost



5. A shop reduced its prices by 13%.

What is the sale price of a coat originally priced at £85?



6. Calculate, showing all working.

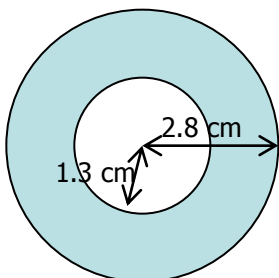
a)  $456 \times 23$

b) 0.5% of £37.50

c) 15% of 587 km

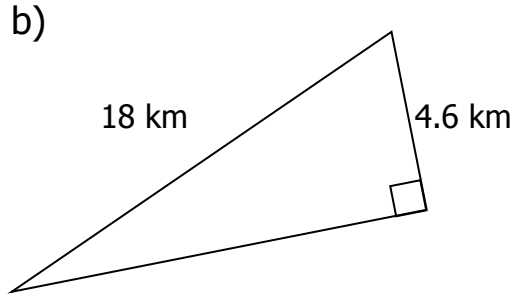
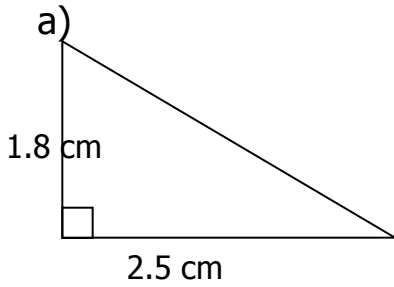


7. Calculate the area of this ring.



## S2 Upper Homework 7

1. Calculate the length of the marked side in each of these triangles.



2. a) List the factors of 36    b) Express 48 as a product of prime factors.

c) Find the lowest common multiple of 8 and 12

d) Find the highest common factor of 20 and 45



3. Solve

a)  $4y = 3y + 7$

b)  $5x = 16 - 3x$

c)  $20 - p = 3p$

d)  $3(w + 5) - 10 = 11$

e)  $2(3d - 7) = 5(1 - d) + 6$



4. Find the Mystery Number. It has 2 digits and the product of its digits is 63. The number is prime and its tens digit is divisible by 3.



5. Calculate showing all working.

a)  $25.7 \times 6000$

b)  $3120 \div 400$

c)  $0.08 \times 0.3$

d)  $23 \times 78$

e)  $4.6 \div 20$

f)  $3.9 \times 40 + 63 \div 30$



6. Evaluate  $p^3 + 2q^2$  when  $p = (-4)$  and  $q = (-6)$



7. Solve, showing all working.

a)  $4(p - 1) < 3(p + 2)$

b)  $3(8 - y) < 4(y - 1)$



8. a)  $1\frac{1}{3} + 2\frac{3}{5} - \frac{7}{10}$

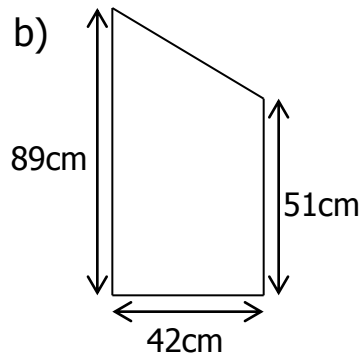
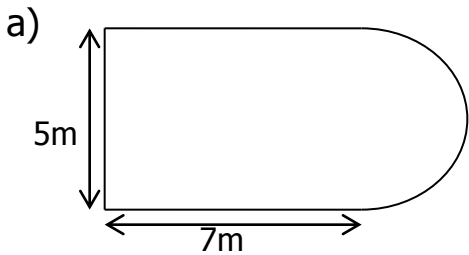
b)  $2\frac{1}{2} \times 3\frac{4}{5}$

c)  $1\frac{3}{4} \div \frac{5}{8}$



## S2 Upper Homework 8

1. Calculate the perimeter of these shapes.



2. Solve, showing all working.

a)  $3(x - 1) < 2(x + 1)$



3. Evaluate  $\frac{p^2 - 4qr}{r}$  when  $p = (-7)$ ,  $q = (-3)$  and  $r = 2$

4. Circular discs of radius 3.5cm are cut from a rectangular sheet of cardboard measuring 50cm by 30cm.



This diagram is not drawn to scale!

a) How many discs can be cut from one sheet of cardboard?

b) How much cardboard is wasted?

c) Calculate the % waste

5. Each time a ball is dropped it rebounds to three fifths of its height.

A ball is dropped from a height of 3 metres.

How many times will it bounce before rebounding to a height of less than half a metre?





## S2 Upper Homework 9

1. Change to standard form.

- a) 3 872      b) 0.00008      c) 6 million      d) 23.56



2. Change to ordinary numbers.

- a)  $5.86 \times 10^{-4}$       b)  $1.6 \times 10^5$       c)  $4.892 \times 10^{-7}$       d)  $2.5 \times 10^4$



3. Work out.

- a)  $3^{10}$       b)  $\sqrt[4]{81}$       c)  $10^3$       d)  $\sqrt[5]{16807}$       e)  $4^{\frac{3}{2}}$

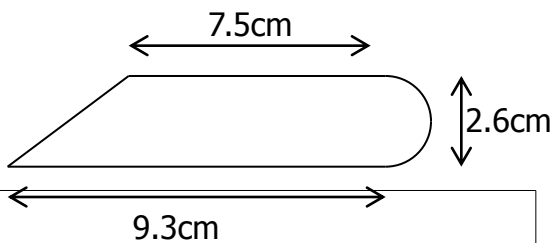


4. Change the subject to the letter in brackets.

- a)  $p = c + d$  (to c)      b)  $y = mx$  (to x)      c)  $t = av + b$  (to b)  
 d)  $f = dn - e$  (to n)      e)  $fg = pq$  (to p)      f)  $abc = de - fg$  (to g)



5. Calculate the area of this shape.



6. Calculate, showing all working.

- a) 3% of 948      b) 65% of £32      c)  $2\frac{7}{8} + 3\frac{5}{11}$       d)  $3\frac{1}{4} - 1\frac{6}{7}$



7. A is the point (4,5), B is (6,2) and C is (3,1).

- a) Draw triangle ABC and reflect it in the x-axis to get A'B'C'.

Write down the coordinates of A', B' and C'.

- b) Reflect A'B'C' in the y-axis to get A''B''C''.

Write down the coordinates of A'', B'' and C''.

- c) What happens to A''B''C'' if it is rotated 180° round the origin?



## S2 Upper Homework 10

1. Calculate, leaving your answer in standard form.

- a)  $(3.5 \times 10^2) \times (4 \times 10^5)$       b)  $(7.12 \times 10^3) + (4.6 \times 10^2)$   
c)  $(4.9 \times 10^6) \div (7 \times 10^3)$       d)  $(3.76 \times 10^2) - (2.9 \times 10)$



2. Change the subject to the letter in brackets.

- a)  $v = Ri$  (to R)      b)  $s = vt$  (to t)      c)  $E = Ri^2$  (to i)  
d)  $P = Ri^2t$  (to i)      e)  $v^2 = u^2 + 2as$  (to a)      f)  $v^2 = u^2 + 2as$  (to u)



3. Solve

- a)  $5r < 30$       b)  $3 + 7y = 31$       c)  $5w - 7 = 2w + 9$   
d)  $6 - 4t > 5t - 8$       e)  $6a + 4 \geq 3 - 2a$       f)  $2w + 9 \leq 3(w - 8)$



4. Gladys bought a picture for £150 and later sold it for £220.

Calculate her percentage profit correct to 3sf.



5. A wheel has a diameter of 32 cm.

- a) What distance will it cover if it turns 500 times? Give your answer in km.  
b) How many revolutions will the wheel make to cover 807 m?



6. Find

- a)  $3^5$       b)  $2^7$       c)  $10^6$       d)  $6^3$       e)  $\sqrt[3]{27}$       f)  $\sqrt[4]{625}$   
g)  $\sqrt[5]{32}$       h)  $\sqrt[4]{81}$       i)  $0.5^2$       j)  $\sqrt{0.04}$



7. A boat sets out from a harbour. It sails north for 8km.

It then sails east for another 12 km.

How far is the boat from the harbour?

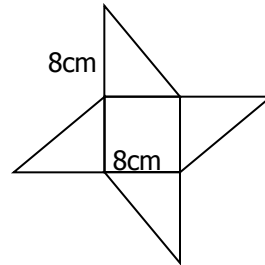


## S2 Upper Homework 11

1. Find the length of PQ if Q is the point (4,-1) and Q is (7,3).



2. Calculate the area and perimeter of this shape - 4 identical triangle and a square.



3. Remove brackets and simplify.

a)  $5(2a - 7) + 4(5 - 4a)$                       b)  $3 - (v - 8) - 7(5 - 8v)$

c)  $5 + 2(3w - 9) + 5(4 - 3w) + 7w$



4. Change the subject to the letter in brackets.

a)  $V = IR$  (to R)                      b)  $PV = RT$  (to V)

c)  $P = 2(L + b)$  (to L)              d)  $q = a(r + s)$  (to s)

e)  $L = \frac{b}{1-a}$  (to b)                      f)  $s = ut + \frac{1}{2} ft^2$  (to u)



5. Change to scientific notation.

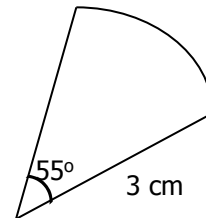
a) 45.78                      b) thirty thousand                      c) 0.000054

6. Change to ordinary numbers

a)  $5.8 \times 10^8$                       b)  $2.66 \times 10^{-3}$                       c)  $4.923 \times 10^5$



7. Calculate the area and perimeter of this sector.



8. Calculate, showing all working.

a)  $4.9 - 7.65 + 5.6$

b)  $1\frac{2}{5} + 3\frac{4}{7}$

c)  $4\frac{1}{3} - 2\frac{6}{11}$



3 cm