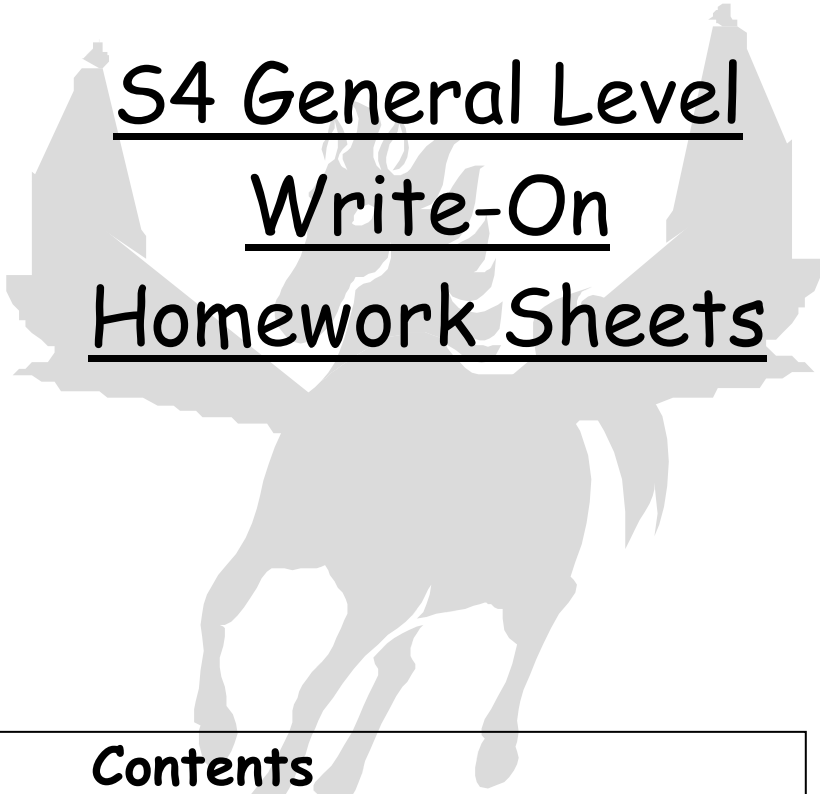


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S4 General Level
Write-On
Homework Sheets

Contents
Gradients & Straight Lines
Trigonometry
Number Review 1
Fractions, Decimals & Percentages
Equations & Inequalities
Statistics
Shape Review
House & Car Costs
Pairs of Straight Lines
Letters & Numbers Review
Proportion
Angles in a Circle
Probability
Area & Volume Review
Answers + Class Record Grid

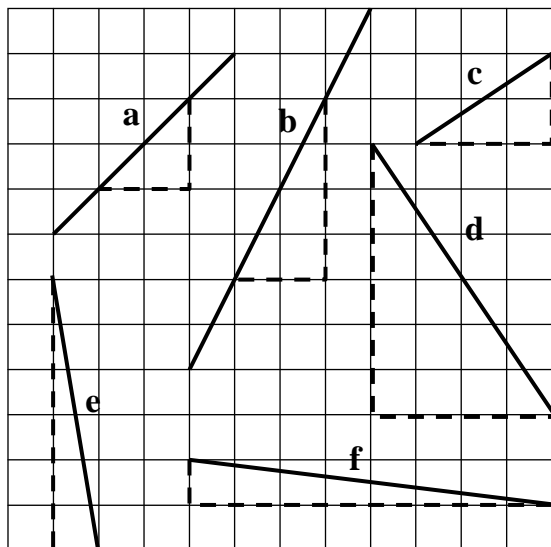
S4 General Homework
Gradients & Straight Lines

Name

Class

Mark

Q1. Find the **gradients** of the lines shown in the diagram below

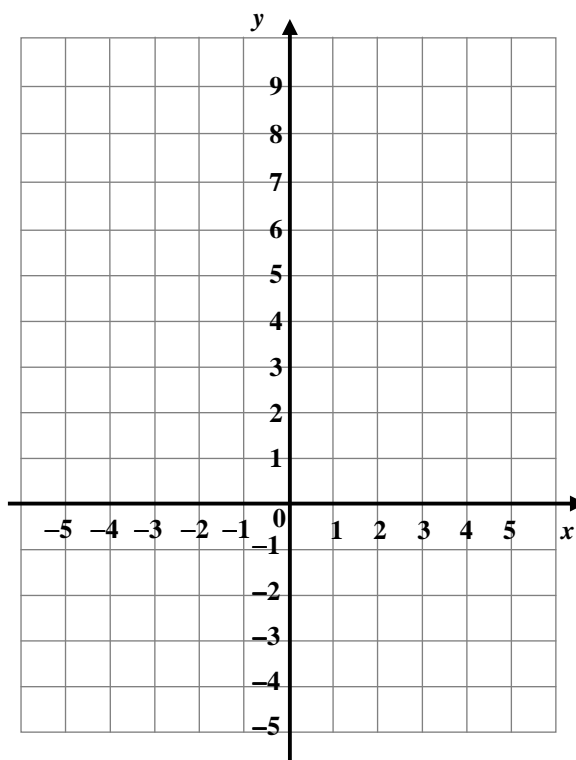


(a)	(b)
(c)	(d)
(e)	(f)

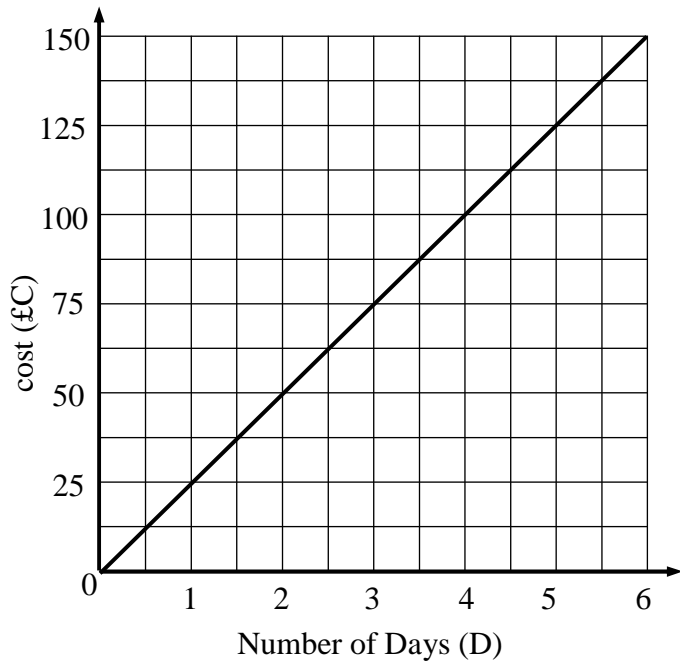
Q2. (a) Complete this table for $y = 2x + 3$

x	-3	-2	-1	0	1	2	3
y		-1					

(b) Plot the points on the grid below and draw a straight line through them.



Q3. Car hire is charged by the day.

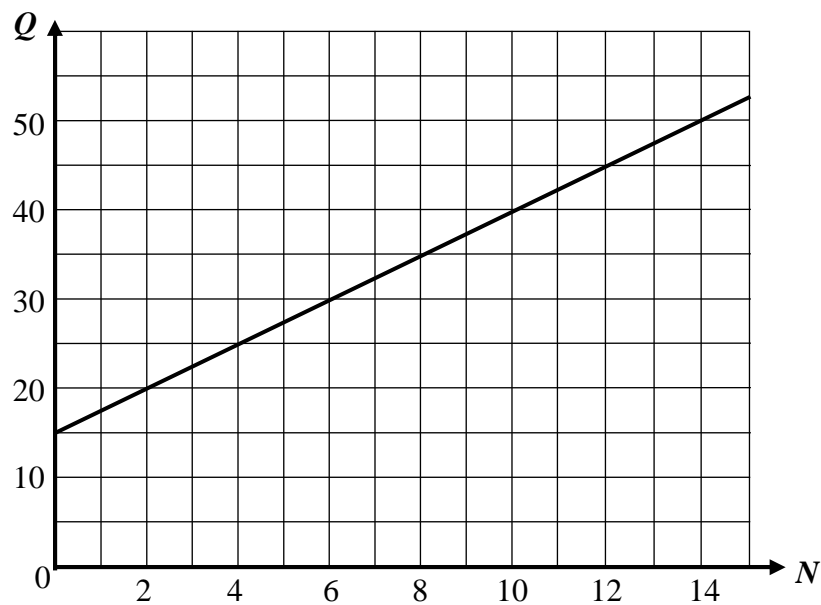


(a) Write down the equation of the line.

(b) Calculate the cost of hiring a car for 8 days.

(c) Geri's bill was £275. For how many days did she hire a car?

Q4.



(a) Find the equation of the line shown in the diagram above.

(b) Find the value of Q when N is 22.

S4 General Homework

Trigonometry

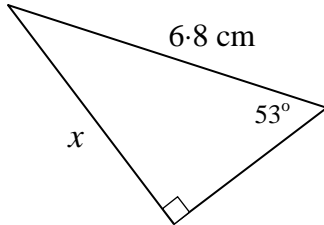
Name

Class

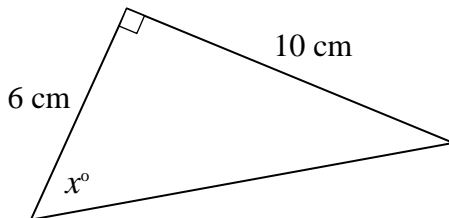
Mark

Q1. Calculate x in each diagram below. *Show all your working.*

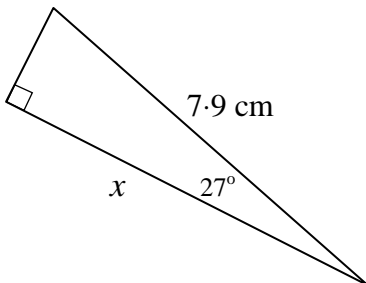
(a)



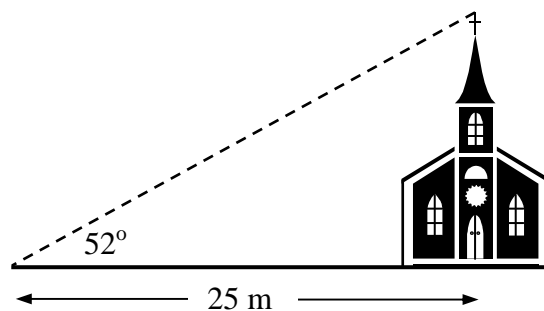
(b)



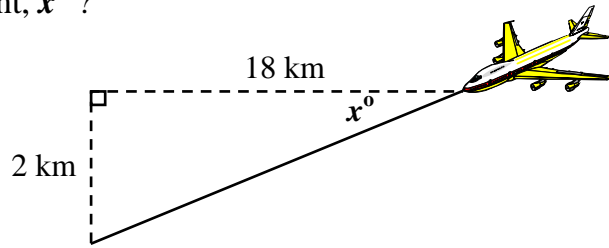
(c)



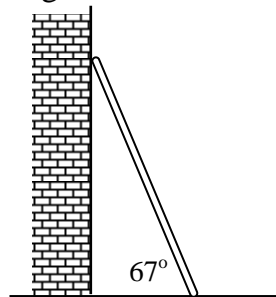
Q2. Jenny is standing 25 metres away from the bottom of a church tower. She looks up at the top at an angle of elevation of 52° . Calculate the height of the tower.



- Q3.** An aircraft making a steady descent decreases height by 2 km in 18 km. What is the angle of descent, x° ?

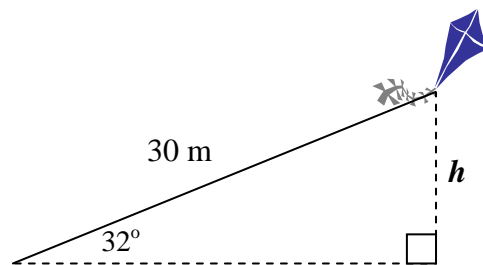


- Q4.** A ladder, which is 6.4 metres long, leans against a vertical wall and makes an angle of 67° with the ground.



Calculate, to the nearest 0.1 m, how far the bottom of the ladder is from the wall.

- Q5.** Eddie is flying his kite. The string is at an angle of 32° to the horizontal. He lets out 30 metres of string. How high is the kite above the ground?



S4 General Homework
Numbers Review

Name

Class

Mark

Q1. Calculate:

(a) $2 + 3 \times 5$

(b) $522 \div 6$

(c) $\sqrt{81}$

(d) $\pounds 12.25 - \pounds 3.97$

(e) $6.8 \div 10$

(f) $\frac{2}{3}$ of 51

(g) 2.19×1000

(h) 6^2

(i) 30% of $\pounds 410$

(j) $\frac{3}{4}$ of 56

(k) 75% of 180g

(l) $8 \times \pounds 9.40$

Q2. Change these units to the units shown in brackets

(a) 12 cm (mm)

(b) 5500 m (km)

(c) 9 mm (cm)

(d) 15 g (mg)

(e) 2.5 tonne (kg)

(f) 890 g (kg)

Q3. Write in standard form

(a) 1 450 000

(b) 0.00079

(c) 245

Q4. Write in full

(a) 5.6×10^{-1}

(b) 1.34×10^4

(c) 8.751×10^2

Q5. Jamie leaves his house at 8.17 a.m. and arrives at school at 8.43 a.m. How long does it take him to travel to school?

Q6. An aeroplane takes $\frac{3}{4}$ of an hour to travel from one airport to another. If it's average speed was 440 km/h, how far apart were the airports ?

Q7. Find the next 3 terms in each of these sequences.

(a) 1, 5, 9, 13,

(b) 20, 17, 14,

(c) 11, 34, 57,

Q8. Write these ratios in their simplest form.

(a) 18 : 12

(b) 2 m : 20 cm

(c) 24 minutes:6 hours

Q9. Share

(a) 200g in the ratio 9:1

(b) £14 in the ratio 2:5

(c) 36 m in the ratio 5:7

Q10. The width of 6 identical textbooks is 13.8 cm. What is the width of 9 of the same books ?

S4 General Homework
Fractions, Decimals,
Percentages

Name

Class

Mark

Q1. Calculate

(a) 1% of 5000

(b) 10% of 120

(c) 70% of 230

(d) $\frac{1}{3}$ of 9.6

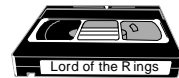
(e) $\frac{2}{5}$ of 85p

(f) $\frac{5}{8}$ of 40

Q2. In a class of 30 pupils, 9 had brown eyes. What percentage is this?

Q3. In a sale all prices are reduced by 35%. What would be the sale price of a mini disc player which originally cost £200?

Q4. Universal Video increased their hire charges by 12%.
 What would it now cost to rent a video that used to cost £3 to hire?



Q5. Complete the table to show equivalent fractions decimals and percentages. (Write the fractions in their simplest form)

fraction	$\frac{3}{5}$				
decimal		0.7		0.75	
percentage			18%		36%

S4 General Homework

Fractions

Name Class Mark

Q1. Change the following to mixed numbers :

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

(b) $\frac{22}{5}$

(c) $\frac{53}{6}$

(d) $\frac{83}{7}$

Q2. Change to fractions :

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

(b) $6\frac{1}{8}$

(c) $2\frac{1}{10}$

(d) $9\frac{7}{9}$

Q3. Calculate each of the following, expressing your answer in its simplest form.

(a) $\frac{2}{5} + \frac{1}{10}$

(b) $\frac{1}{2} - \frac{1}{6}$

(c) $\frac{5}{8} - \frac{2}{5}$

Q4. Calculate

(a) $3\frac{1}{2} + 1\frac{5}{6}$

(b) $3\frac{5}{8} + 2\frac{1}{4}$

(c) $6\frac{7}{8} - 4\frac{1}{3}$

Q5. At a school, $\frac{1}{8}$ of the time is spent in mathematics classes and $\frac{3}{20}$ is spent in English classes.



(a) What fraction of the time is spent on English and mathematics together ?

(b) If $\frac{1}{20}$ of the time is spent in games, what fraction of the time is spent on all the other subjects ?

Q6. Express as a single fraction in its simplest form

(a) $\frac{4}{5} \times \frac{1}{16}$

(b) $\frac{12}{13} \times \frac{39}{48}$

(c) $\frac{24}{35} \div \frac{20}{21}$

Q7. Calculate

(a) $1\frac{1}{4} \times 2\frac{1}{3}$

(b) $3\frac{1}{2} \div 1\frac{3}{4}$

(c) $3\frac{3}{5} \div 2\frac{1}{4}$

S4 General Homework
Equations & Inequalities

Name

Class

Mark

Q1. Solve these equations

(a) $5x = 20$

(b) $z + 8 = 15$

(c) $y - 9 = 1$

(d) $2x - 12 = -3$

(e) $5z + 9 = 4$

(f) $6y - 9 = 2y + 5$

Q2. Solve these inequalities, giving your answer from the set $\{-2, -1, 0, 1, 2, 3, 4, 5, 6, 7\}$

(a) $2x < 2$

(b) $x + 5 \geq 8$

(c) $3x + 8 \leq 2$

Q3. Solve these inequalities

(a) $7x > 42$

(b) $5x - 3 \leq 22$

(c) $3x - 2 > -11$

Q4. Solve these equations

(a) $8k - 5 = 5k + 1$

A large empty rectangular box provided for the student to show their work for solving the equation $8k - 5 = 5k + 1$.

(b) $6(a - 1) = 4(a + 2)$

A large empty rectangular box provided for the student to show their work for solving the equation $6(a - 1) = 4(a + 2)$.

Q5. Solve these inequalities

(a) $9x + 2 \leq 6x + 11$

A large empty rectangular box provided for the student to show their work for solving the inequality $9x + 2 \leq 6x + 11$.

(b) $5(y - 2) > 2(y + 4)$

A large empty rectangular box provided for the student to show their work for solving the inequality $5(y - 2) > 2(y + 4)$.

Q6. Solve these inequalities, giving your answer from the set $\{-3, -2, -1, 0, 1, 2, 3, 4, 5, 6\}$

(a) $7x - 3 > 2x - 23$

A large empty rectangular box provided for the student to show their work for solving the inequality $7x - 3 > 2x - 23$.

(b) $9(y + 2) \leq 7(y + 4)$

A large empty rectangular box provided for the student to show their work for solving the inequality $9(y + 2) \leq 7(y + 4)$.

S4 General Homework

Statistics

Name

Class

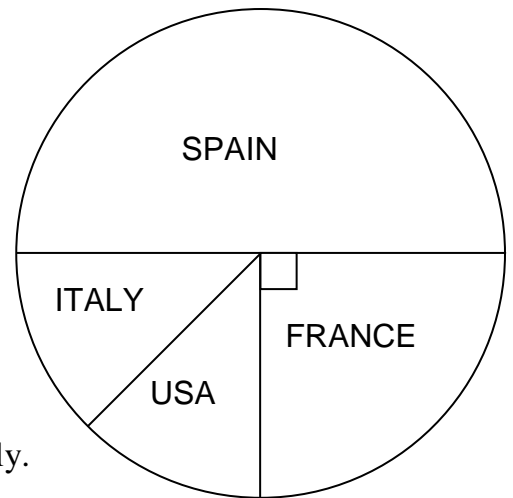
Mark

- Q1.** 80 people were asked their favourite country for going on holiday.
The results are shown in the pie chart.

(a) What **fraction** of the people preferred France?

(b) **How many** people preferred Spain?

(c) The same number of people liked USA as liked Italy.
How many liked USA?



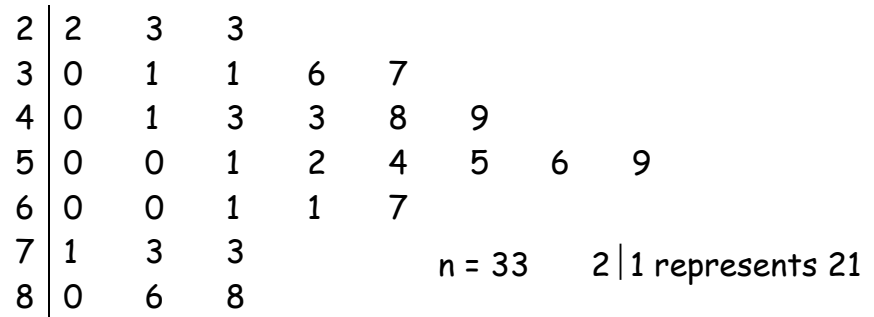
- Q2.** Sam's class held a competition to find out who could hold their breath the longest.
The results, in seconds, are shown below:

34 56 82 65 44 61 78 32 45 52
51 63 49 47 39 56 25 43 47 41

(a) Draw a stem-and-leaf diagram to illustrate this data.

(b) What is the median number of seconds for this data?

Q3. The stem and leaf chart below shows the amounts of money spent by customers in a shop :



Write down

(a) the median

(b) the range

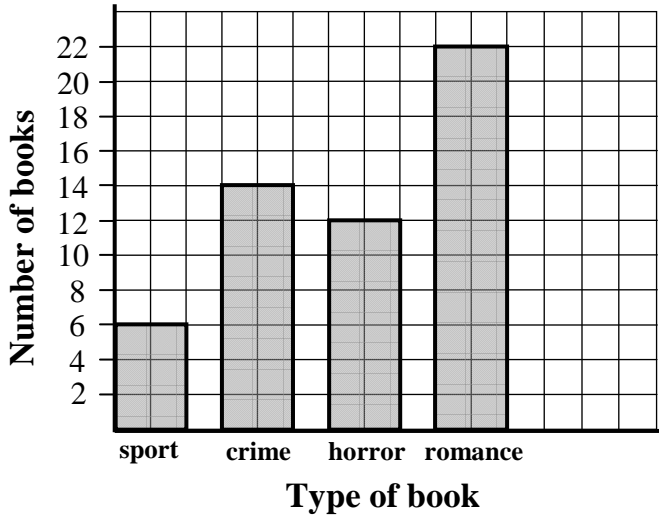
Q4. The ages of the players in a local football team are given below :

19 23 25 24 19 25 31 27 28 30 33

(a) Calculate the mean and median .

(b) The two oldest players leave and are replaced by two players aged 18 and 26. Calculate the mean and median age of the team now.

Q5. The bar chart shows the different types of books borrowed from a school library in one day.



(a) There were also 16 science-fiction books borrowed that day. Add a bar to the chart to show this.

(b) What was the most popular type of book borrowed?

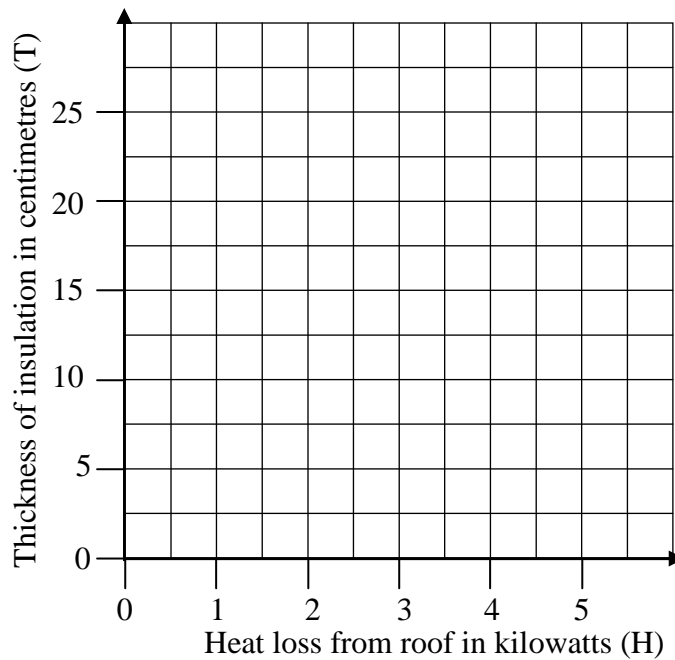
(c) How many more pupils chose 'crime' than 'sport' books?

(d) What is the probability that a pupil chosen at random had borrowed a horror book?

Q6. The table below shows the connection between the thickness of insulation in a roof and the heat lost through the roof.

Heat loss in kilowatts (H)	1.5	1.8	3	4	4.4	4.6
Thickness in cm (T)	22.5	18	10	11	6.5	2.5

(a) Draw a scatter diagram on the graph below



(b) Draw the best fitting straight line through the points

(c) Use your graph to estimate the heat loss from 15 centimetres of insulation

S4 General Homework

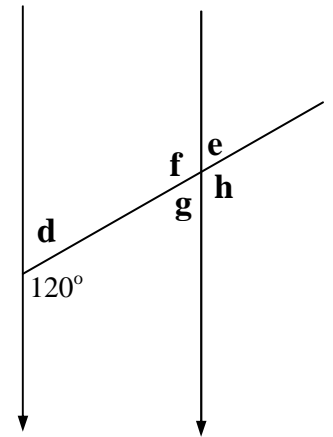
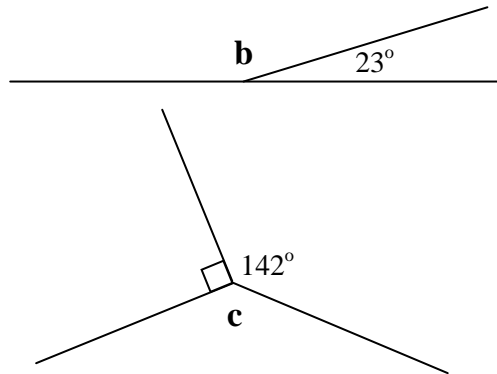
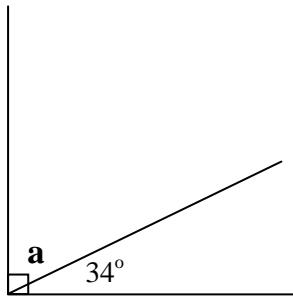
Shape & Space Review

Name

Class

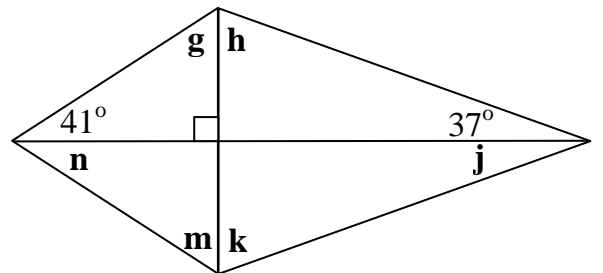
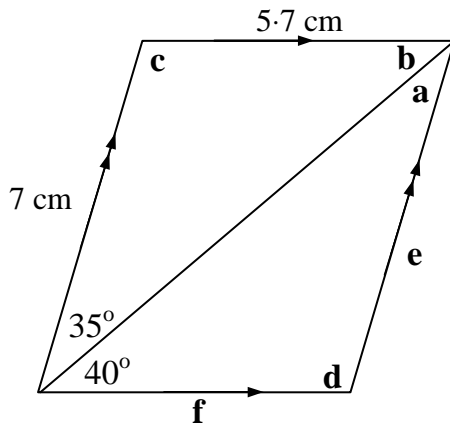
Mark

Q1. Calculate the sizes of the missing angles in the diagrams below.



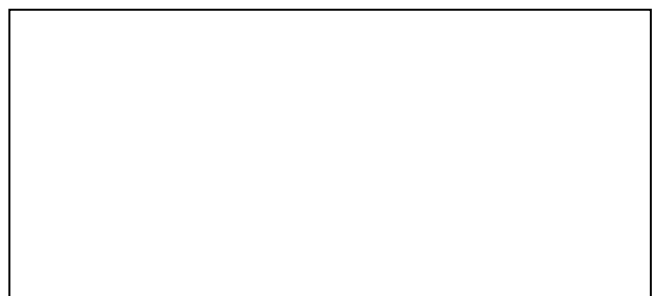
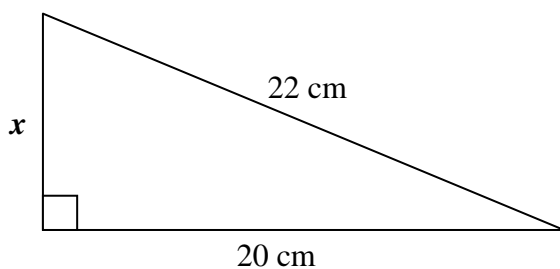
a	b	c	d	e	f	g	h
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Q2. Find the missing lengths and angles in the quadrilaterals shown below

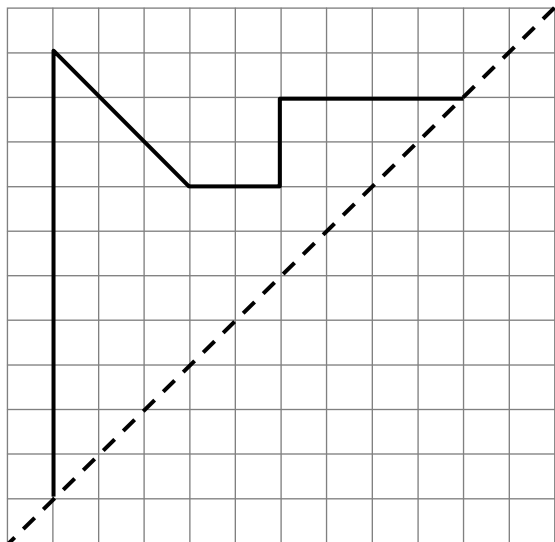


a	b	c	d	e	f
g	h	j	k	m	n

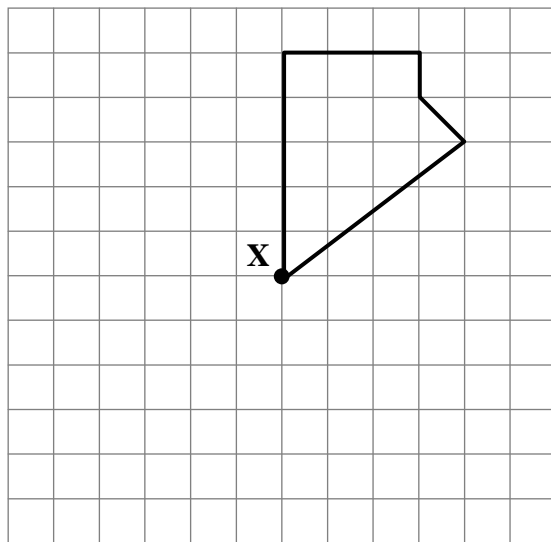
Q3. Calculate x in the diagram below



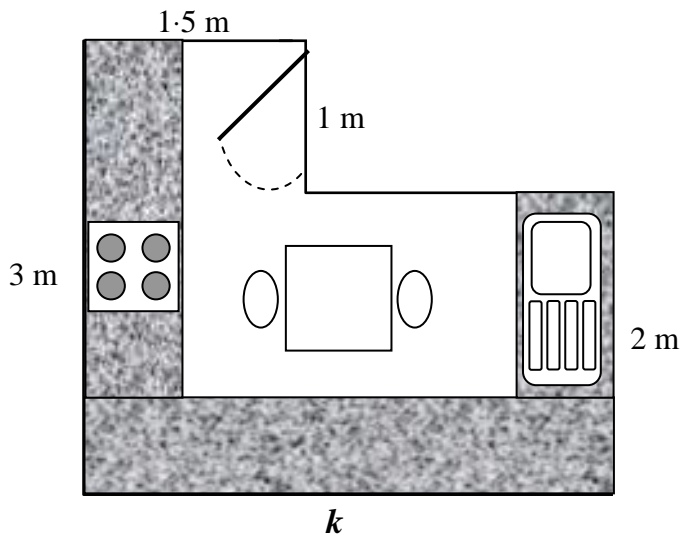
Q4. (a) Complete this diagram so that the dotted line is a line of symmetry.



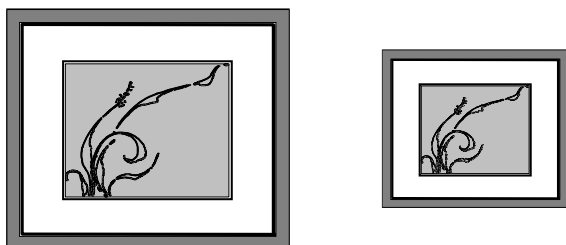
(b) Complete this diagram so that **X** is a centre of **four-fold** rotation symmetry.



Q5. The diagram shows a scale drawing of a kitchen. The scale is 1 cm to 0.5 m. Measure the diagram and then calculate the **real** length of the wall marked *k*.



Q6.



These two picture frames are similar. The larger is 15 cm wide and the smaller is 10 cm wide.
If the large frame is 12 cm high, what is the height of the small frame?



S4 General Homework
House & Car Costs

Name

Class

Mark

- Q1.** James buys a house costing £45 000.
The building Society will only give him a 90% mortgage.
How much does he need to pay for the deposit?



Q2.



The Barratt family is moving to a new home. It cost £68 000.
They had to pay a deposit of 5%.

- (a) How much will they need to take out a mortgage for?

- (b) If the mortgage payments are £6.40 per £1000, how much will they pay per month?

Q3.



Arthur has a ring which is valued at £1200.
If it appreciates at the rate of 6% per year, how much will it be worth
in 3 years time?

- Q4.** Mr. & Mrs Scott are taking out a new insurance policy for their house and contents. The rates they are quoted are:

<p style="text-align: center;">BB INSURANCE <i>Buildings</i> £3 per £1000 <i>Contents</i> £5.80 per £1000</p>

<p style="text-align: center;">COVER DIRECT <i>Buildings</i> £2.80 per £1000 <i>Contents</i> £6.70 per £1000</p>

If their house is worth £75 000 and they have contents valued at £12 000, which of the two companies will give them the better deal?

- Q5.** Gemma buys a car for £6000. It depreciates by 30% in the first year and 20% the second year, how much is it worth after 2 years?

S4 General Homework
Pairs of Straight Lines 1

Name

Class

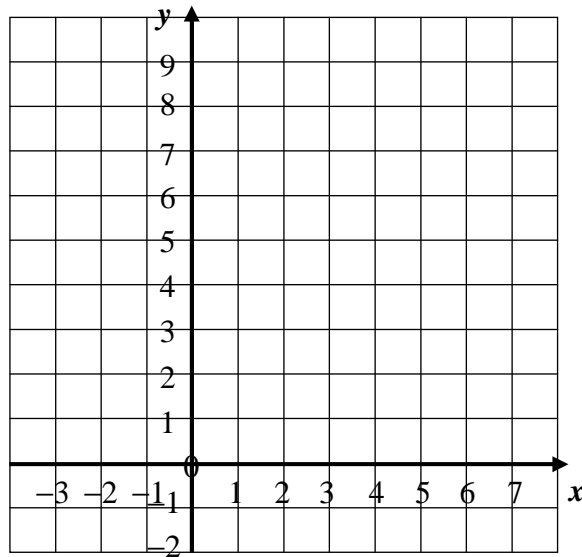
Mark

Q1. (a) Complete the tables below for $y = 2x$ and $y = x + 4$.

$y = 2x$	x	-1	0	5
	y			

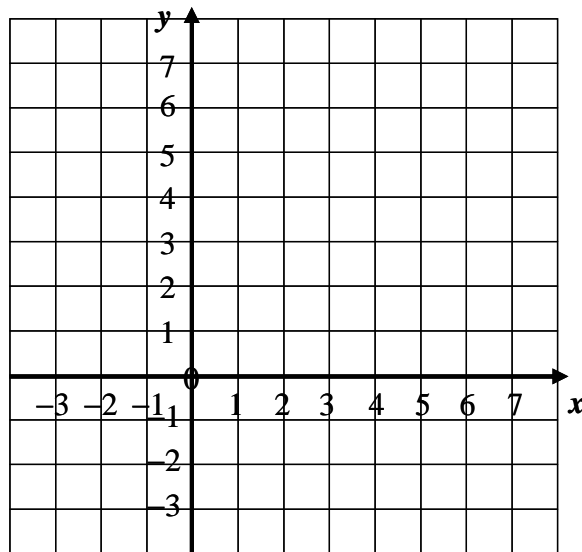
$y = x + 4$	x	-3	0	5
	y			

(b) Draw the graphs on the axes below.



(c) Write down the point where the lines cross.

Q2. (a) On the axes below, draw the graphs of $x + y = 6$ and $y = x + 3$.



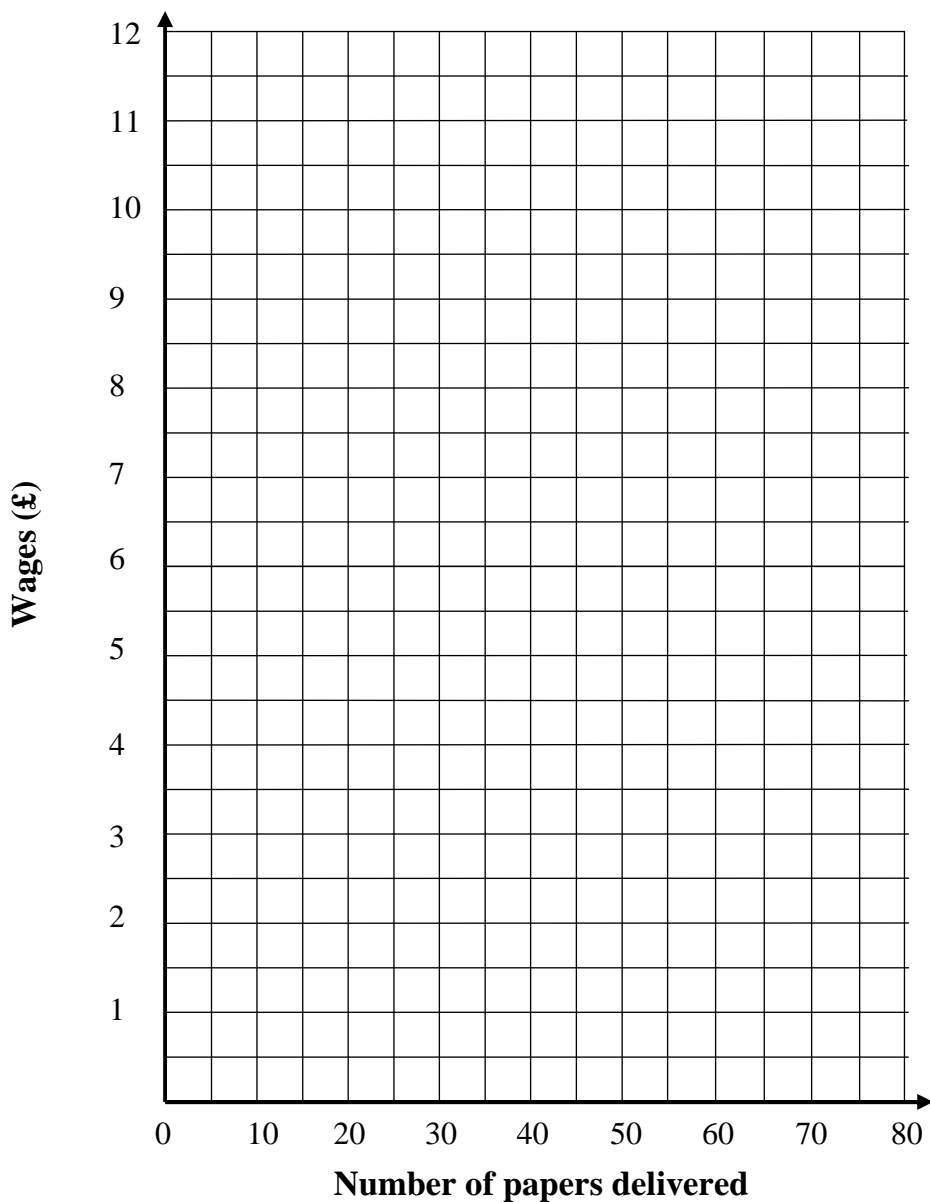
(b) Write down the coordinates of the point of intersection of the two lines.

Q3. Martin is looking for a job as a paper delivery boy. He sees two adverts. Pete's Papers is offering a wage of £5 plus 5p per paper delivered. Dave's Daily Delivery offers 15 p per paper delivered.

(a) Complete the table below

Number of papers (N)	0	10	20	30	40	50	60	70	80
Pete's Papers (£)	5	5.50	6						
Dave's Daily (£)	0	1.50	3						

(b) Draw graphs of both sets of wages.



(c) Which company would you recommend Martin to take a job with? (Give reasons)

S4 General Homework
Pairs of Straight Lines 2

Name

Class

Mark

Q1. Solve these pairs of equations by substitution:

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

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

Q2. Solve these pairs of equations by elimination:

(a) $x + y = 12$
 $x - y = 2$

(b) $4x + y = 21$
 $x + y = 6$

(c) $7x + 3y = 20$
 $2x - y = 2$

(d) $5x + 3y = 30$
 $3x + y = 14$

S4 General Homework
Letters & Numbers Review

Name

Class

Mark

Q1. Simplify:

(a) $2x - 3x + 5x$

(b) $8y - 5y - 3y$

(c) $2s + 3t - s + 5t$

Q2. Multiply out the brackets

(a) $6(x - 5)$

(b) $3(3a + 1)$

(c) $5(7 - 4y)$

Q3. Factorise:

(a) $8y + 48$

(b) $15x - 20$

(c) $6a + 9b$

Q4. Calculate

(a) $-2 - 8$

(b) $-7 + (-5)$

(c) $18 - (-5)$

(d) $-30 - (-11)$

Q5. $A = 3b - 2c$. Find the value of A when

(a) $b = 5, c = 4$

(b) $b = 8, c = 12$

(c) $b = 9, c = 15$

Q6. Solve these equations

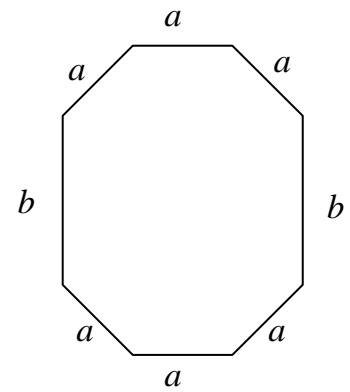
(a) $x + 5 = 13$

(b) $6y = 3y + 15$

(c) $9a + 2 = 5a - 6$

Q7. (a) Write down the formula for the perimeter of this shape.

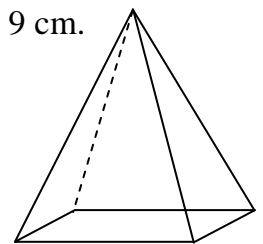
P =



(b) Calculate P when $a = 3$ cm and $b = 5$ cm.

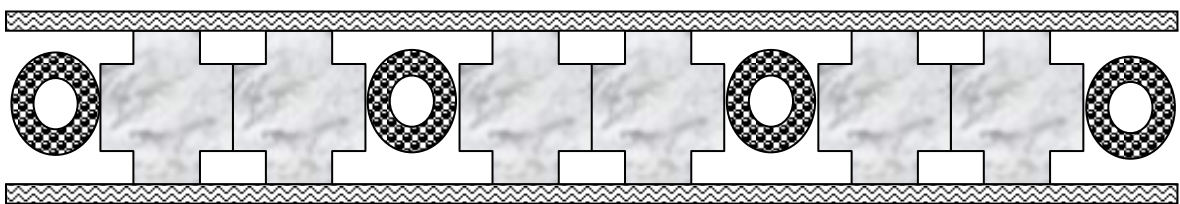
Q8. The volume of a pyramid is given by $V = \frac{1}{3}Ah$, where A is the area of the base and h is the height.

(a) Calculate the volume if the area of the base is 49 cm^2 and the height is 9 cm.



(b) How many ice cubes with edges 3cm would you need to melt to fill the pyramid with water?

Q9. *Coronet Wallcoverings* make several designs for wallpaper borders one of which is shown below. The pattern is made up of circle shapes and cross shapes.



(a) Complete the table below.

<i>Number of circle shapes (C)</i>	2	3	4	5	6	7
<i>Number of cross shapes (N)</i>	2		6			

(b) Write down a formula connecting the number of cross shapes, N , and the number of circle shapes, C .

$N =$

Q10. Solve these inequalities, taking your answers from the set $\{-3, -2, -1, 0, 1, 2, 3\}$

(a) $x \leq 2$

(b) $x + 5 > 6$

(c) $x - 1 < 0$

Q11. Solve these inequalities.

(a) $2x \geq 14$

(b) $2x - 5 < 7$

(c) $4x + 3 > -1$

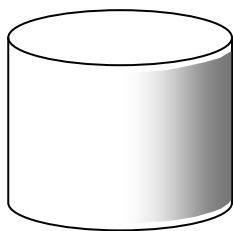
(d) $7x - 2 < 5$

(e) $5x + 1 \leq 2x + 10$

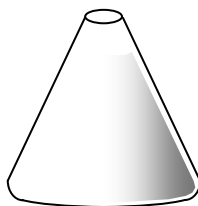
(f) $8x - 12 > 3x - 17$

Q12. Match these graphs to the containers which release water from their bases at a steady rate.

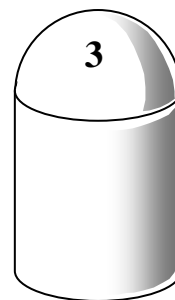
1



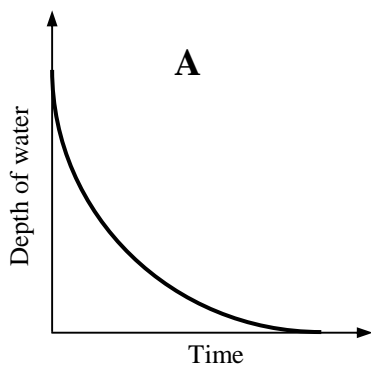
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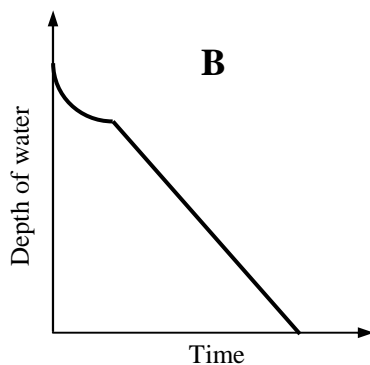
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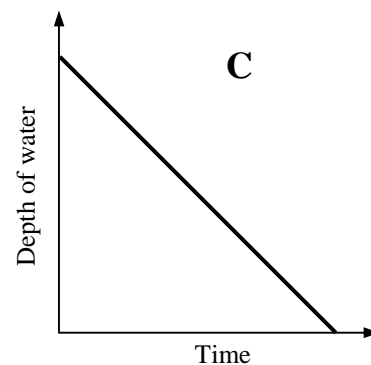
A



B



C



S4 General Homework
Proportion

Name

Class

Mark

Q1. Jafar's heart beats at the rate of 84 beats per minute. How many beats will it make in 5 minutes?

Q2. A jet can cover a distance of 2436 miles in 3.5 hours. What is its rate of travel in **miles per hour**?

Q3. Complete the table below for bicycle hire at £7.50 per day.

Number of days	1	2	6	9	15
Cost (£)					

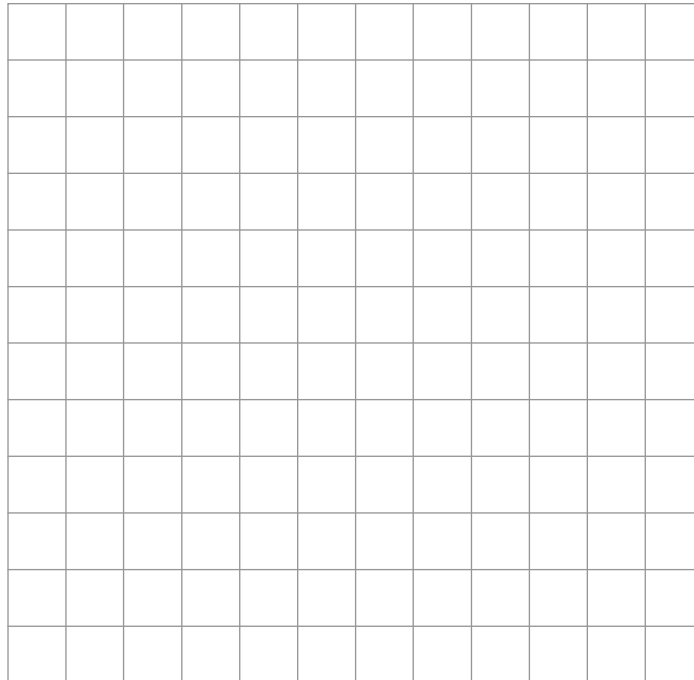
Q4. Jack drives 400 km in 5 hours. At the same rate, how far could he drive in 8 hours?

Q5. Paula paid £22 for 40 litres of petrol. How much would she pay for 47 litres?

Q6. The mass of 20 cm^3 of a metal is 30grams. What is the mass of 16 cm^3 ?

Q7. (a) Using this table of values, draw a graph of N against C.

Number of tickets (N)	5	10	15	20	25
Cost (C)	20	40	60	80	100



(b) Describe the graph.

(c) Find a formula for C

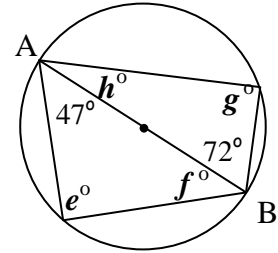
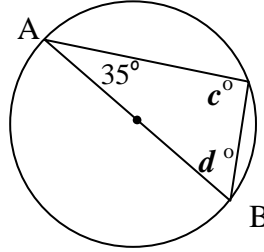
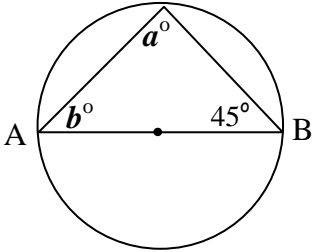
S4 General Homework
Angles in a Circle

Name

Class

Mark

Q1. In each of the diagrams below AB is a diameter. Find the missing angles in each diagram.



a

b

c

d

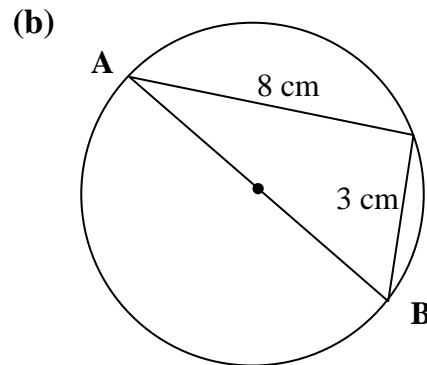
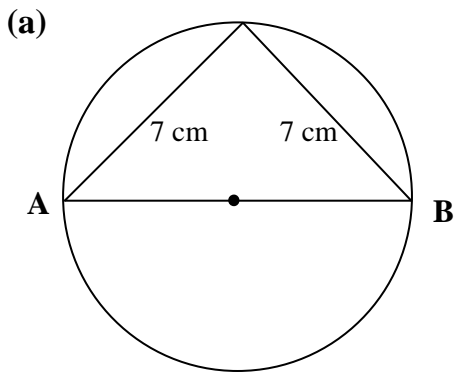
e

f

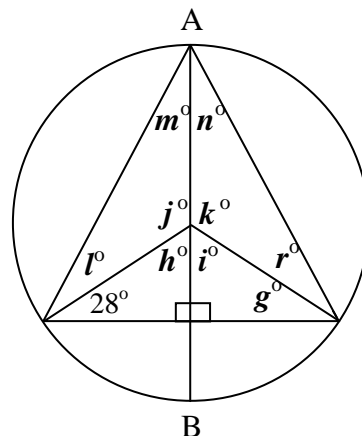
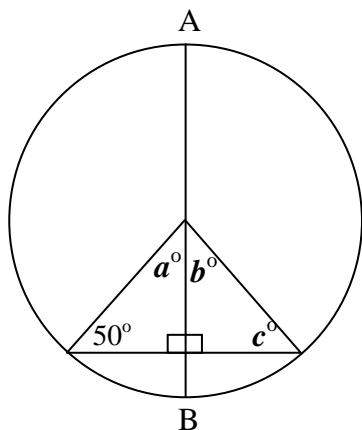
g

h

Q2. Find the length of the diameter AB in each of the circles below, given the other 2 sides of the triangle.



Q3. Use the symmetry properties of the circle to find the missing angles in the diagrams below. In each diagram AB is a diameter.



a

b

c

g

h

i

j

k

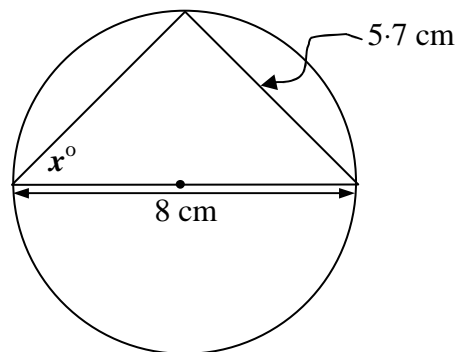
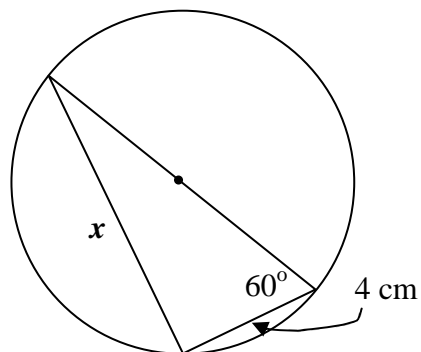
l

m

n

r

Q4. Find x in each of the diagrams below.



S4 General Homework

Probability

Name

Class

Mark

Q1. The probability that it will rain is 83%. What is the probability that it won't rain?

Q2. The probability that Grampa Smith will beat Grampa Jones at dominoes is $\frac{2}{5}$. How many games would Grampa Smith expect to win if they play 30 games?

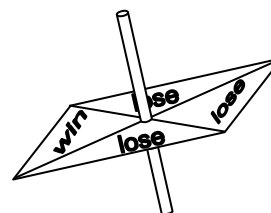
Q3. (a) Complete this table to show all the possible combinations of flipping a coin and rolling a dice.

	1	2	3	4	5	6
H	(H, 1)	(H, 2)				
T	(T, 1)					

(b) Calculate:

(i) $P(\text{H, even number})$ **(ii)** $P(\text{H, 6})$ **(iii)** $P(\text{T, factor of 6})$

Q4. The table shows results after every 50 spins of a spinner.



number of wins	12	26	30	50	70	81	91
number of spins	50	100	150	200	250	300	350
relative frequency							

Complete the table to show the relative frequencies.

S4 General Homework
Areas & Volumes Review

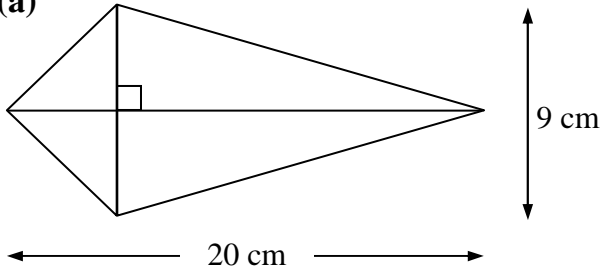
Name

Class

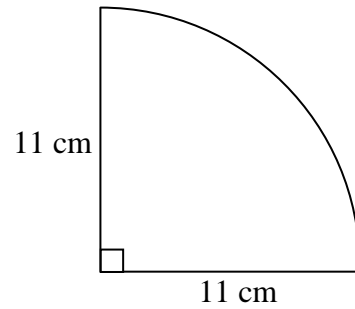
Mark

Q1. Find the area of each shape below.

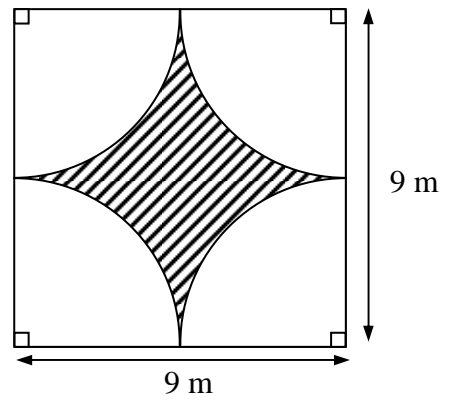
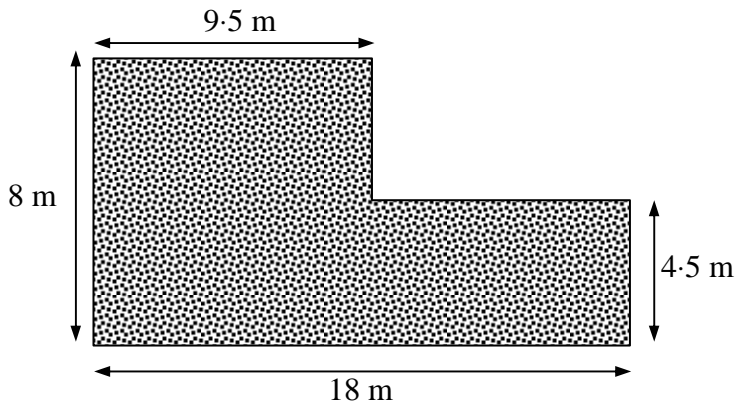
(a)



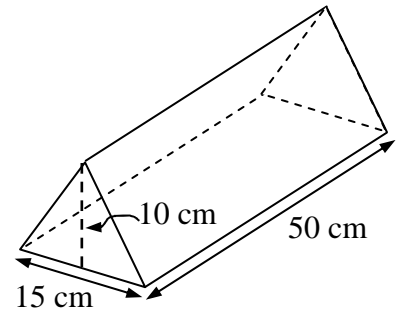
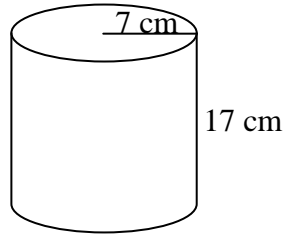
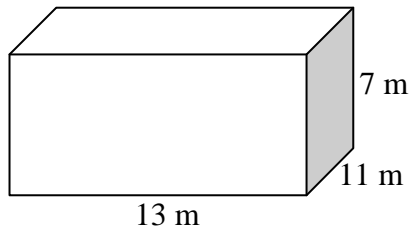
(b)



Q2. Find each shaded area below.



Q3. Find the volumes of the solid shapes below.



Q4. How many toy building bricks, 6 cm by 4 cm by 2 cm, would fit into a storage box 30 cm by 16 cm by 10 cm?

Q5. Calculate the volume of chocolate ice-cream in this vanilla and chocolate desert in the shape of a cylinder, with chocolate on the outside and vanilla inside.

