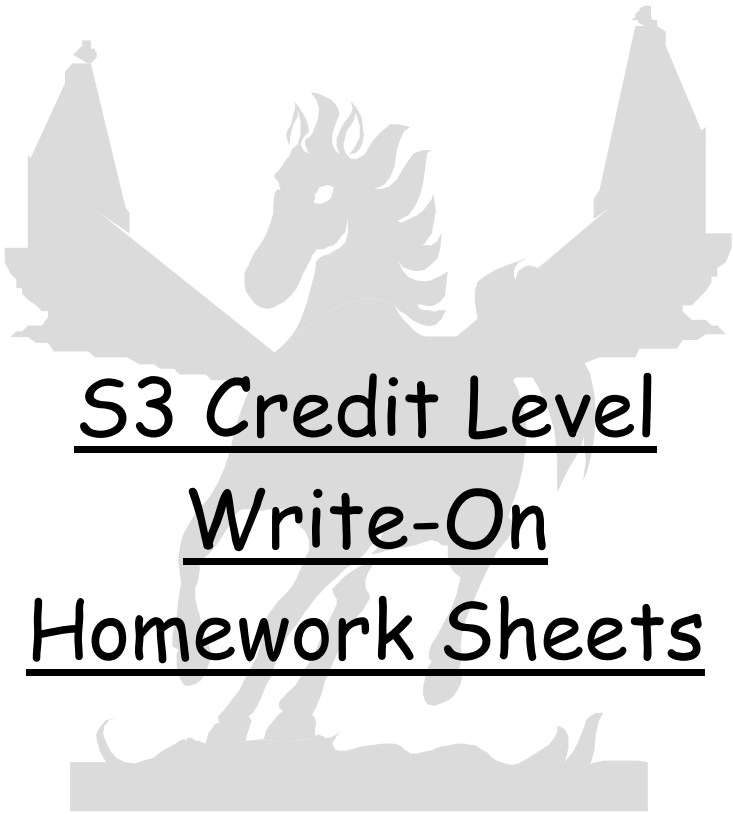
HOMEWORK
WORKSHEETS

CREDIT LEVEL



S3 Credit Level Write-On Homework Sheets

Contents

S3 Credit Homework
Calculations & Calculators 1

Name

Class

Mark

Q1. Calculate:

a. $5 + 2 \times 3$ **b**. $18 - 9 \div 3$ **c**. $36 \div 6 + 3$ **d**. $(25 + 15) \div 4$

Q2. Round to the nearest 10

a. 48 **b**. 192 **c**. 3761 **d**. 11005

Q3. Round each to the number of decimal places shown in brackets

a. $3 \cdot 87$ (1) **b**. $16 \cdot 234$ (2) **c**. $52 \cdot 4926$ (3) **d**. $303 \cdot 6728$ (1)

Q4. Round each to the number of significant figures shown in brackets

a. 5068 (1) **b**. 38383 (2) **c**. 626817 (3) **d**. $0 \cdot 0649$ (1)

Q5. Write in standard form

a. 80000 **b**. 43500000 **c**. $0 \cdot 0064$ **d**. $0 \cdot 00000172$

Q6. Write in full

a. $2 \cdot 3 \times 10^{-4}$ **b**. 5×10^{3} **c**. $7 \cdot 89 \times 10^{6}$ **d**. $4 \cdot 25 \times 10^{-5}$

Q7. Calculate the following, giving your answer to 2 significant figures.

a. $\sqrt{14}$ **b**. $\sqrt{0.26}$ **c**. $\sqrt{6^2 + 4^2}$ **d**. $\sqrt{9^2 - 2^2}$

S3 Credit Homework
Calculations & Calculators 2

Name

Class

Mark

Q1. 15391 people attend a football match. Round this number to the nearest
a. thousand **b**. hundred **c**. ten

Q2. A pack of breakfast cereal weighs 285 grams.
Calculate, to the nearest **kilogram**, the weight of a carton containing 60 packs.

Q3. A coffee table top measures 1·1 metres by 80 centimetres. Calculate its area, giving your answer in **square metres**, correct to 1 decimal place.

Q4. Write the numbers in each of these sentences in standard form.
a. The mass of the moon is about 79 250 000 000 000 000 000 000 kg
b. The relative density of hydrogen is 0.000 089 9

Q5. Write the numbers in each of these sentences in full.
a. The number of seconds in a decade is about 3.2×10^{8}
b. The size of a molecule of water is roughly 1×10^{-3}

Q6. Calculate each of the following, giving your answers in standard form.

a. $(4{\cdot}2 \times 10^{10}) \times (3 \times 10^{-2})$ **b**. $\dfrac{4 \cdot 2 \times 10^{5}}{8 \times 10^{-1}}$ **c**. $\dfrac{(3 \cdot 2 \times 10^{2}) \times (4 \cdot 5 \times 10^{-3})}{3 \times 10^{-6}}$

Q7. Use your calculator to find the following. Answer to 1 dp where necessary.

a. $8{\cdot}4 \div (9{\cdot}6 - 5{\cdot}7)$ **b**. $20 \times (2{\cdot}1 + 5{\cdot}9)$ **c**. $\dfrac{58}{(1 \cdot 2 \times 14)}$

Q8. A group of friends went to a burger bar. $^{2}/_{5}$ of them bought a burger, $^{1}/_{3}$ bought chips and the rest bought cola.
What fraction of the group bought cola ?

Q9. A piece of plastic tubing 22½ cm long has to be cut into small pieces each ¾ cm long. How many pieces will there be?

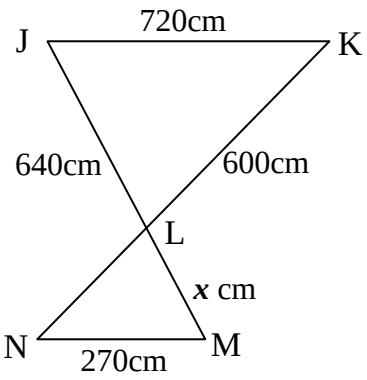
S3 Credit Homework
Similar Shapes

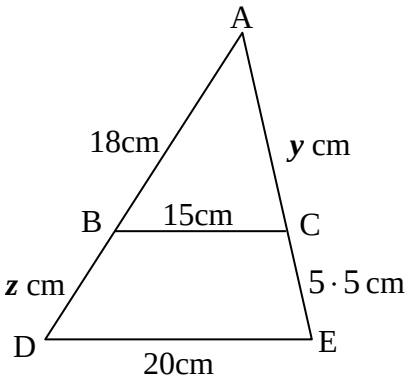
Name

Class

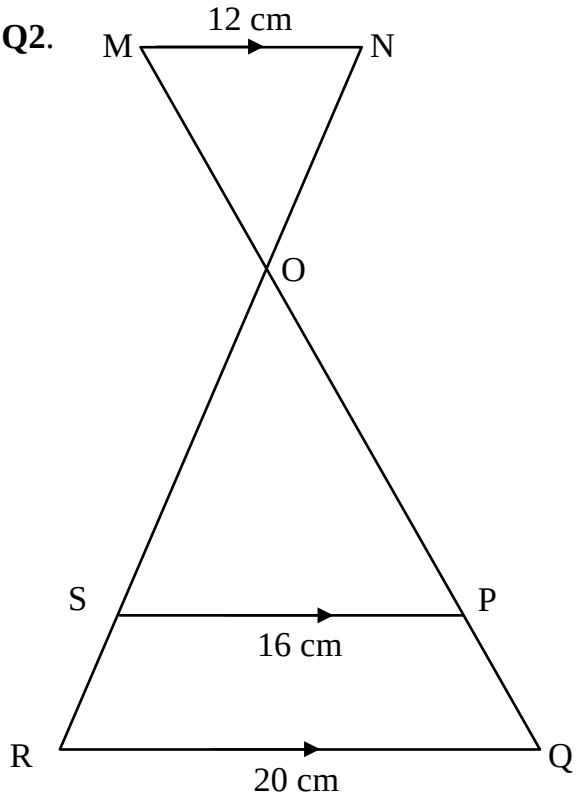
Mark

Q1. Calculate the value of ***x*** , ***y*** and ***z*** in the diagrams below.



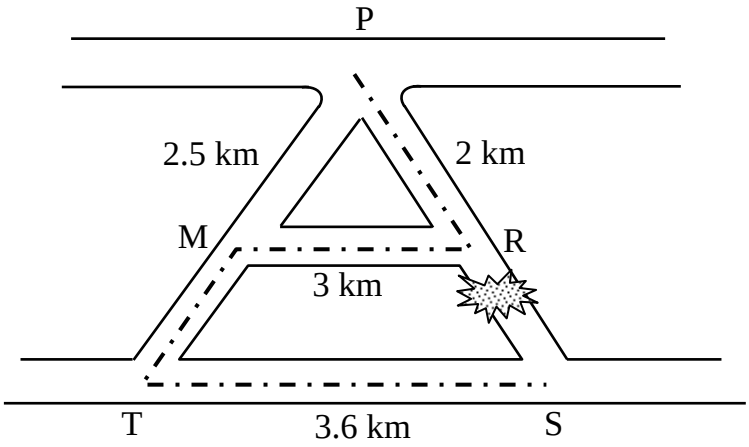


Q2.



In the diagram, MN, SP and RQ are parallel.
If ON is 21.6 cm, calculate the length of SR.

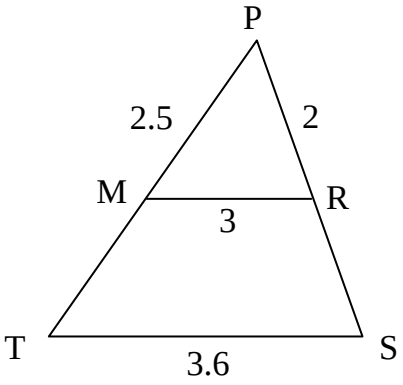
Q3.



The diagram shows a system of roads which are represented below as similar triangles.

A man driving from P to S, reaches R before discovering that the road between R and S is blocked .

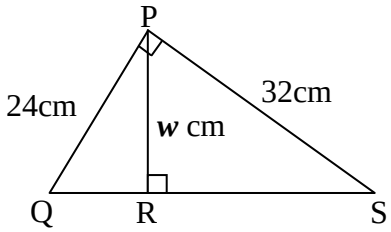
He takes the detour P→ R→M→T→S.



PM = 2.5 km, MR = 3 km, PR = 2 km and ST = 3.6 km.

How much **greater** was his journey than going directly from P to S ?

Q4. Calculate ***w*** in the diagram below.



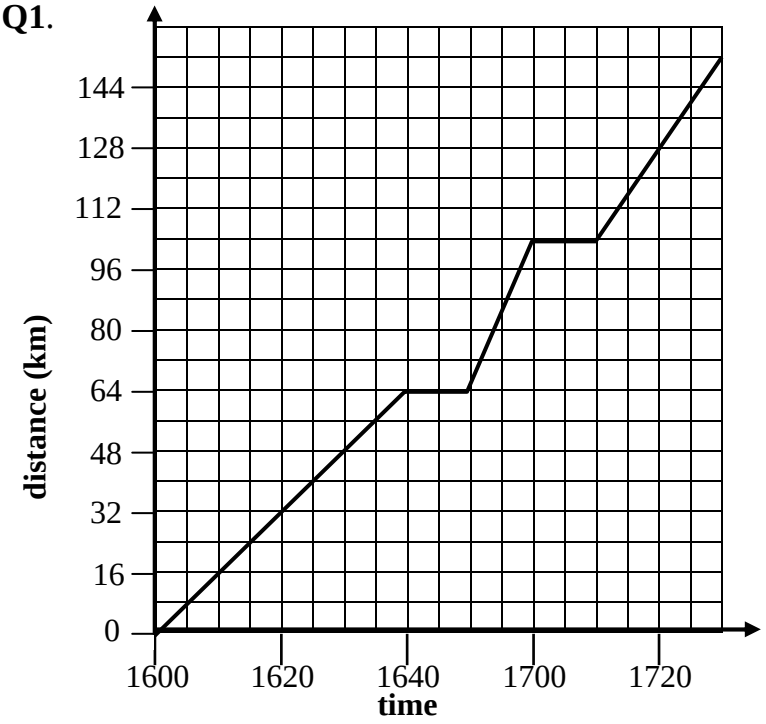
S3 Credit Homework
Distance, Speed, Time

Name

Class

Mark

Q1.



The graph shows the progress made by a car during a 90 minute journey.

a. How far had the car travelled after one hour?

b. How long did it take to cover the first 40 km?

c. Calculate the average speed in km/h during the first 30 mins.

d. Calculate the car's speed for the entire journey.

Q2. The overnight sleeper train leaving London at 2340 is due at Carlisle at 0315, Glasgow at 0430 and Fort William at 0610.
At Carlisle the train is 15 minutes late. By Glasgow it has made up 5 minutes.

a. Write down the actual arrival times of the train at Carlisle and Glasgow.

b. The distance between Glasgow and Fort William 165 kilometres. What speed would the train need to travel to reach Fort William on time?

Q3. **a**. A lorry leaves a depot at 0645 and travels at an average speed of 64 km/h to its destination 240 km away.
At what time did the lorry reach its destination?

b. On the return journey it leaves at 1335 and arrives back at the depot at 1615. Calculate the speed for the return journey.

Q4. A supersonic aircraft is flying at 2000 km/h.
a. If it flies at this speed from 1446 to 1610, what distance will it have travelled?

b. How many **seconds** will it take the plane to travel 20 kilometres?

Q5. A man started his journey at 0953 and arrived at his destination at 1126.
a. How long did his journey take?

b. What was the average speed if the distance was 12 kilometres?
(Give your answer correct to 1 decimal place)

S3 Credit Homework
Spending & Saving

Name

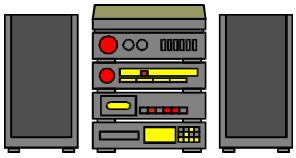
Class

Mark

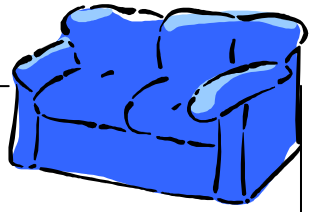
Q1. A shop assistant receives a gross weekly wage of £146.15 for a 37 hour week.
What is the hourly rate ?

Q2. Tony is paid a basic monthly salary of £450 plus commission of 12% of his total monthly sales. Calculate his total earnings in a month where his sales total £9000.

Q3. VAT is charged at 17.5%. How much VAT would be paid on a music system costing £99.90 before VAT? Round your answer to the nearest 1p.



Q4. A mail order company sells a sofa for £469.95. It offers Hire Purchase terms of deposit of £69.95 and 24 monthly payments of £21.50
Calculate **a**. the total HP cost ?
b. how much you save by paying cash ?



a.

b.

Q5. **a**. Soraya is travelling to Europe and changes £245 into Euros at the rate of £1 = €1.64. How many Euros does she receive ?

b. She spends 300 Euros. When she returns she exchanges the Euros she has left for British money at the rate of £1 = €1.47. How much will she get, to the nearest penny ?

Q6. Complete this electricity bill.

account issued		reference	Southern Electric	from	to
5th November		SEB0139		1st Sep	1st Nov
meter readings		Details of charges		Amount	
present	previous	standing charge		£13.50	
19334	18202		units @ 8.65p		
			subtotal		
			VAT @ 17.5%		
			TOTAL BILL		

Q7. Blair invests £3000 in a building society offering a rate of 4·5% per annum. How much interest will he get if he leaves his money in the account for 8 months?

S3 Credit Homework
Positive & Negative Numbers

Name

Class

Mark

Q1. Calculate:

a. -5×8

b. $-2 - 11$

c. $-9 \times (-4)$

d. $18 \div (-3)$

e. $21 - (-5)$

f. $-54 \div (-6)$

g. $-7 + (-9)$

h. $-7 \times (-6)$

Q2. If $a = 4$, $b = -3$ and $c = 9$, find the value of the following

a. $ab + c$

b. $-(bc)$

c. $\dfrac{b+c}{a}$

d. $-a(b + c)^2$

e. $b^2 - c$

f. $(abc)^2$

g. $c^2 - b$

h. $a^2 - 2b$

Q3. Simplify

a. $5a + (-2a)$

b. $-3p \times 4q$

c. $(-7r) \times (-7r)$

d. $\dfrac{-5y \times (-6y)}{-3}$

Q4. Solve the following equations for x :

a. $3x = -15$

b. $-7x = 49$

c. $-5x = -40$

d. $6x + 14 = 8$

e. $12 - 4x = 36$

f. $50 + 6x = 26$

g. $7x + 7 = 5x - 11$

h. $3x + 13 = 9 - 5x$

i. $4x - 8 = 6x - 14$

S3 Credit Homework
Pythagoras Theorem 1

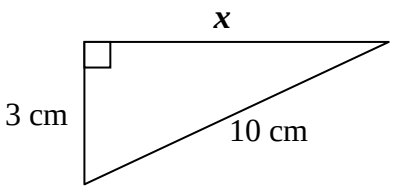
Name

Class

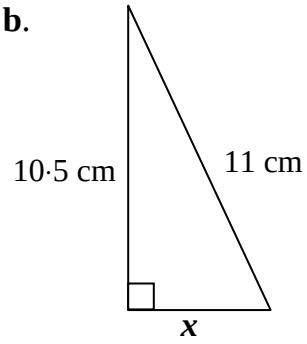
Mark

Q1. Calculate the length of the side marked ***x*** in each of these right angled triangles:

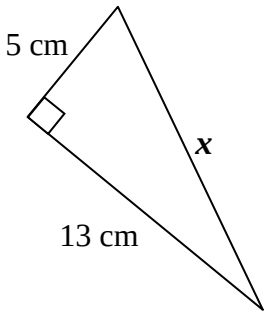
a.



b.

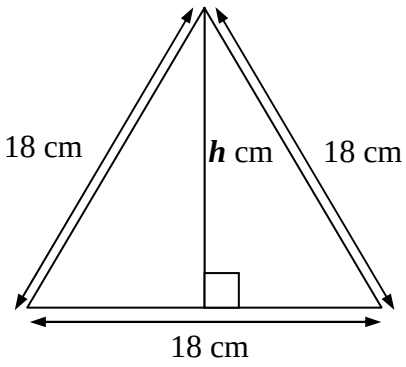


c.



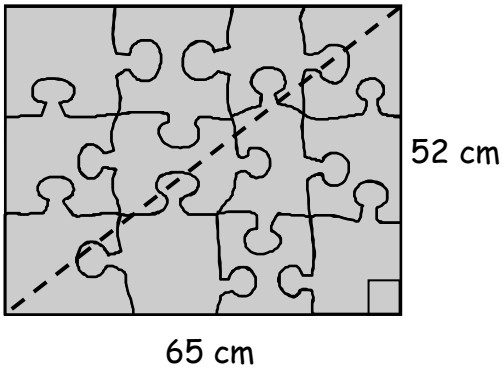
Q2. An equilateral triangle can be split into two identical (congruent) right angled triangles, as shown here

a. Calculate the height, ***h*** cm, of an equilateral triangle whose sides are each 18 cm long.



b. Calculate the area of the equilateral triangle.

Q3. A rectangular jigsaw measures 65 cm by 52 cm.
Will it fit onto a circular table with diameter 80 cm?



Q4. **a.** A is the point (1, 2), B is (7, 4) and C is (5, 6).
Calculate the length of each side of the triangle ABC.

b. Is triangle ABC right-angled?

S3 Credit Homework
Pythagoras Theorem 2

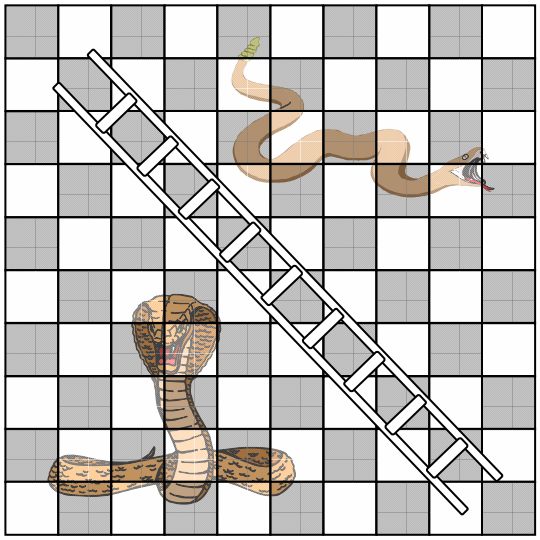
Name

Class

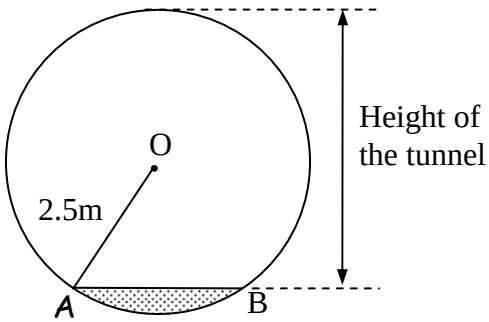
Mark

Q1. A square snakes & ladders board has 100 squares and a diagonal of length 35 cm.

Find the length of side of one of the small squares.



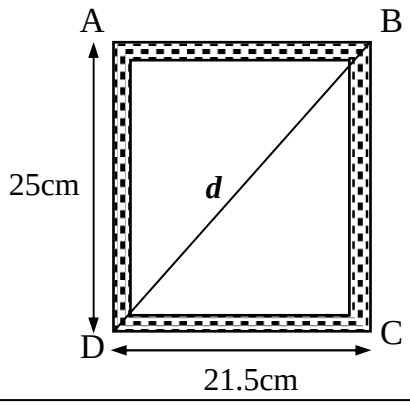
Q2.



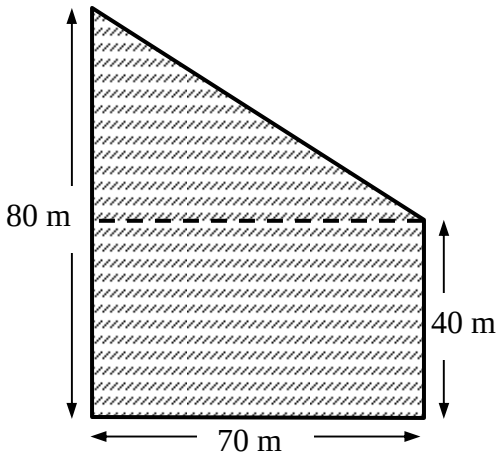
The figure shows the cross section of a tunnel with a horizontal floor AB which is 2.4 metres wide .
The radius OA of the cross section is 2.5 metres.
Find the height of the tunnel .

Q3. Calum is making a picture frame, ABCD .

It is 25 cm high and 21.5 cm wide.
To check whether the frame is rectangular, he measures the diagonal, ***d***.
It is 31.5 cm long .
Is the frame rectangular ?



Q4. Calculate the perimeter of this field, which is made up of a rectangle and a right angled triangle.



S3 Credit Homework
Brackets & Equations 1

Name

Class

Mark

Q1. Multiply out the brackets

a. $9(a + 5)$ **b**. $7(y - 8)$ **c**. $4(w + 9)$ **d**. $15(6 - c)$

Q2. Multiply out the brackets

a. $x\,(x^3 + 2)$ **b**. $a\,(ab + 3c)$ **c**. $3m\,(8 - m)$ **d**. $2y^2(w - 5y)$

Q3. Multiply out the brackets and simplify

a. $3(x + 7) + 2x$ **b**. $16y - 5(2y + 3)$ **c**. $7(s - 2) - 13$

Q4. Multiply these brackets

a. $(x + 4)(x + 7)$ **b**. $(y - 9)(y - 3)$ **c**. $(s + 12)(s - 2)$

d. $(2a + 5)(a + 9)$ **e**. $(3w - 8)(2w + 1)$ **f**. $(4x - 3)^2$

S3 Credit Homework
Brackets & Equations 2

Name

Class

Mark

Q1. Solve these equations by first multiplying out the brackets

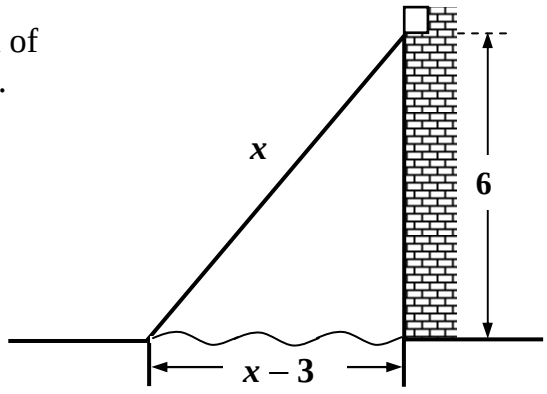
a. $7(x - 4) = 42$

b. $3(3a - 1) - 11 = 49$

Q2. Solve : $(x + 6)(4x - 3) = (2x + 3)^2$

Q3. The King's Knights are attacking Baron Bracket's Castle. The height of the window they want to reach is 6m from the ground.
The width of the moat is 3m less than the length of the ladder (x m), which just reaches the window.

Use Pythagoras' Theorem to find the length of the ladder and the width of the moat.



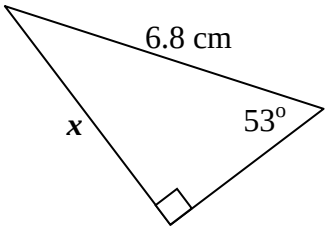
S3 Credit Homework
Trigonometry 1

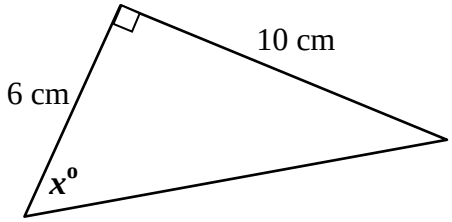
Name

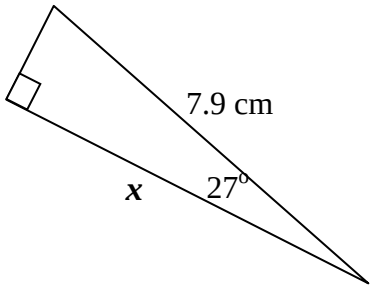
Class

Mark

Q1. Calculate x in each diagram below:

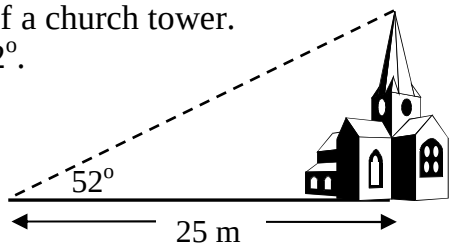




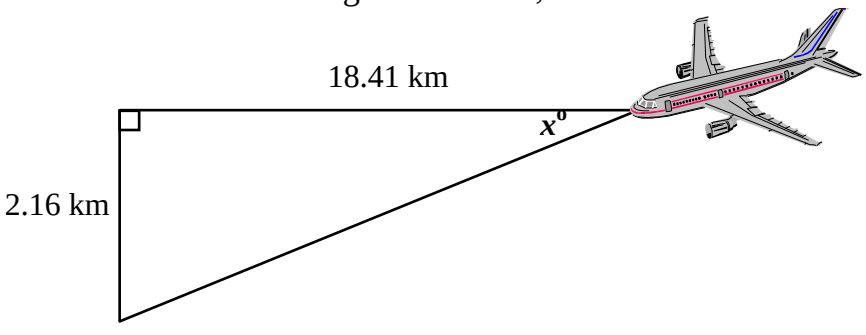


Q2. Jenny is standing 25 metres away from the bottom of a church tower.
She looks up at the top at an angle of elevation of 52°.

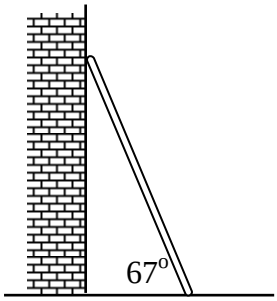
Calculate the height of the tower.



Q3. An aircraft making a steady descent decreases height by 2.16 km in 18.41 km.
What is the angle of descent, x^o ?



Q4.

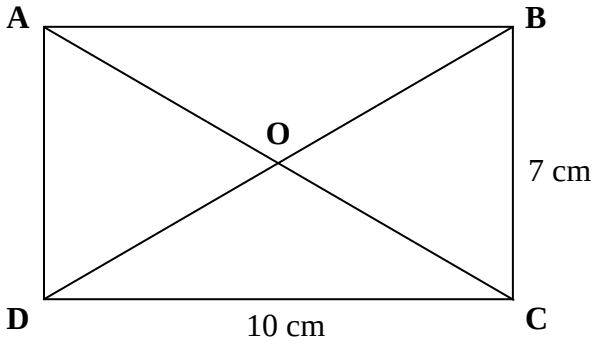


A ladder, which is 6·4 metres long, leans against a vertical wall and makes an angle of 67^o with the ground.

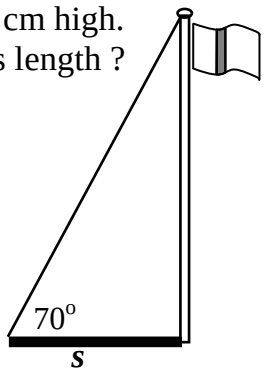
Calculate, to the nearest 0.1 m, how far the bottom of the ladder is from the wall.

Q5. The sides of a rectangle are 10 cm and 7 cm long.

Calculate the sizes of angle AOB, the obtuse angle between the diagonals of the rectangle.



Q6. This diagram shows the shadow, ***s***, cast by a flagpole early in the afternoon. The flagpole is 1000 cm high. What is the shadow's length ?



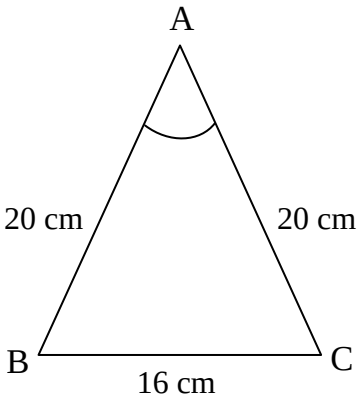
S3 Credit Homework
Trigonometry 2

Name

Class

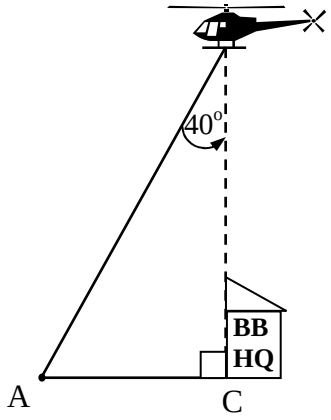
Mark

Q1. Find the size of angle BAC in the triangle below.

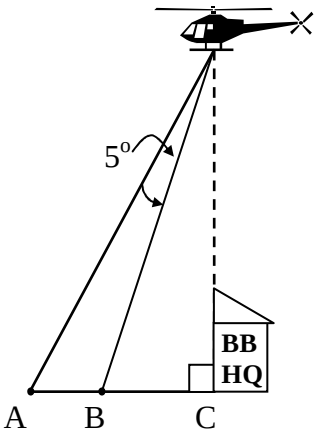


Q2. A police helicopter is hovering 500 metres above the ground, directly over Burglar Bob's headquarters.

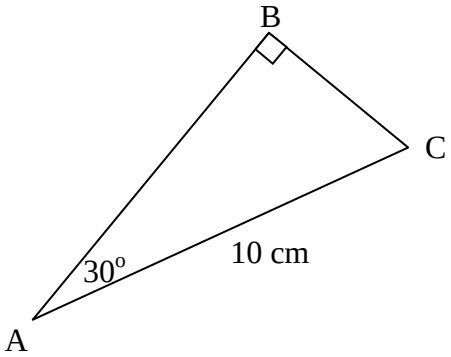
a. It catches Bob, at point A, in its spotlight which is shining at an angle of 40^o from the vertical. How far is Bob from his HQ, the distance AC?



b. Bob runs towards his headquarters. The spotlight catches him again by moving 5^o towards the vertical. How far has Bob run (from A to B)?



Q3.



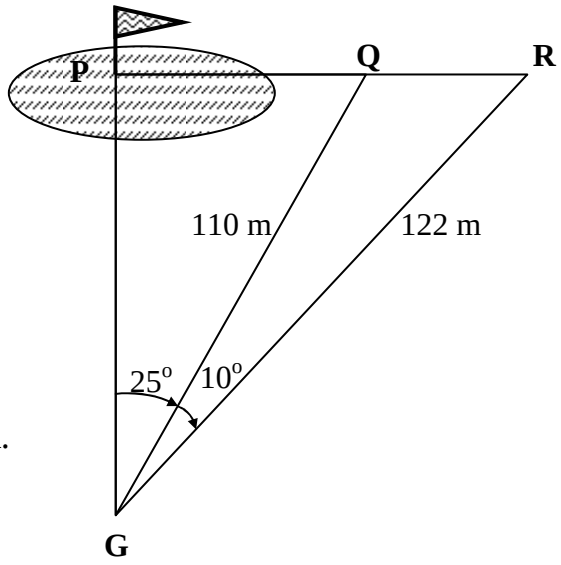
Triangle ABC is right-angled at B with the hypotenuse measuring 10 cm.
Angle BAC is 30^o.

Calculate the area of triangle ABC.

Q4. Eric and Ernie are both very bad golfers.
Eric is at G and aiming for the pin, P, which is straight ahead of him.
Unfortunately, he hits the ball 25^o to the right and it lands 110 metres away at Q.

Ernie is also aiming for the pin but he hits his ball 10^o further to the right and it lands at R, a distance of 122 metres.

Calculate the distance between the balls at Q and R.



S3 Credit Homework
Simultaneous Equations

Name

Class

Mark

Q1. Solve algebraically

a. $3p - 2q = 4$
$7p - 3q = 1$

b. $3a + 1.2b = 14.4$
$a - 0.5b = 3$

Q2. Mr. Martini is ordering tea and coffee for his cafe. He spends exactly £108 on these each month.
In March he orders 4kg of tea and 6kg of coffee. In April he changes his order to 8kg of tea and 3 kg of coffee.

How much do the tea and coffee cost each per kilogram ?

Q3. An electrical goods warehouse charges a fixed price per item for goods delivered plus a fixed rate per mile.

The total cost to a customer 40 miles from the warehouse for the delivery of 5 items was £30.
A customer who lived 100 miles away paid £54 for the delivery of 2 items.

Find the cost to a customer who bought 3 items and lives 70 miles away.

Q4. A straight line with equation $y = ax + b$ passes through the points (2, 4) and (–2, –2).

Find the equation of the line.

S3 Credit Homework
Areas & Volumes 1

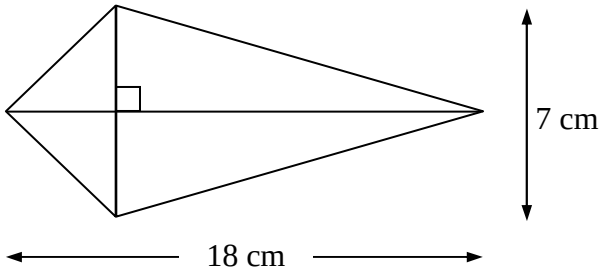
Name

Class

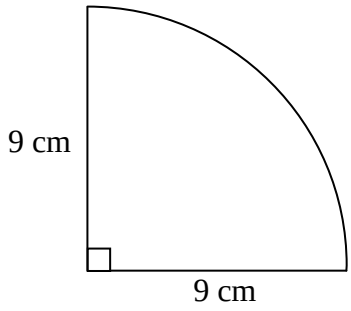
Mark

Q1. Find the area of each shape below.

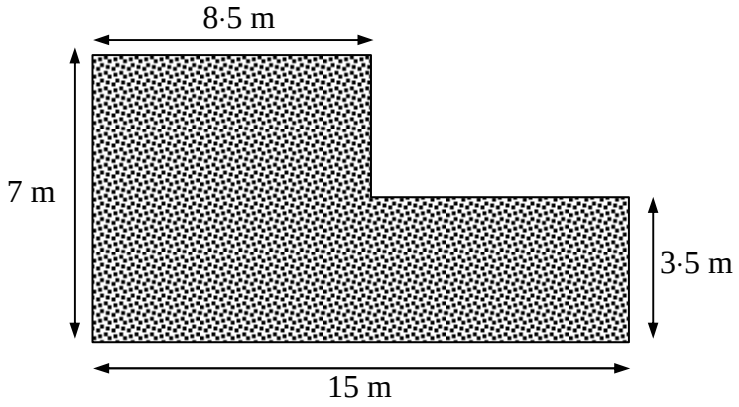
a.

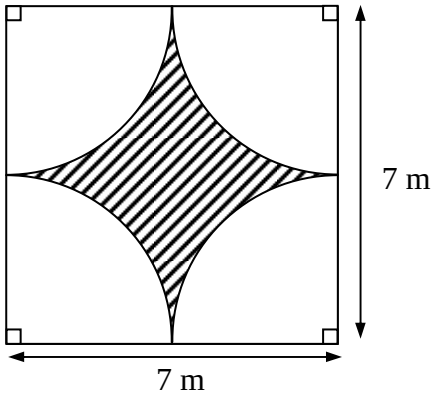


b.

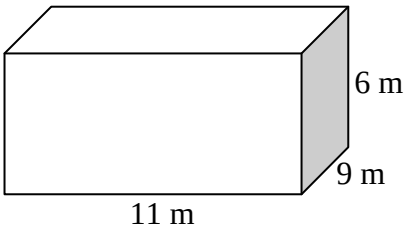


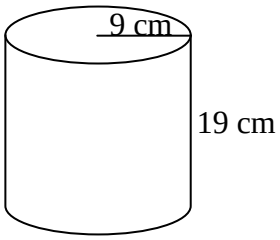
Q2. Find each shaded area below.

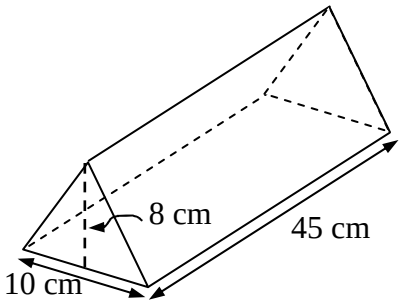




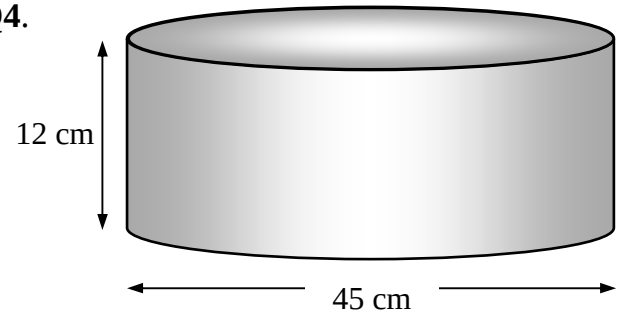
Q3. Find the volumes of the solid shapes below.







Q4.



Calculate the total surface area (top, bottom and curved surface) of this cylindrical tin.

S3 Credit Homework
Areas & Volumes 2

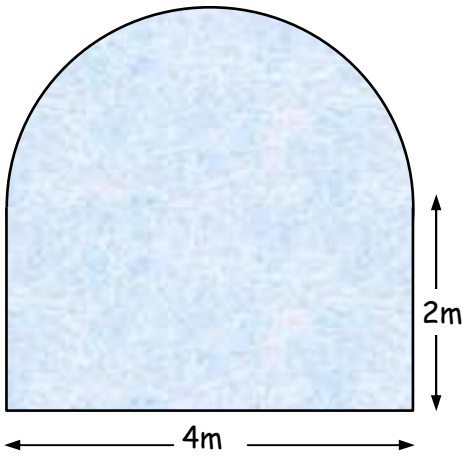
Name

Class

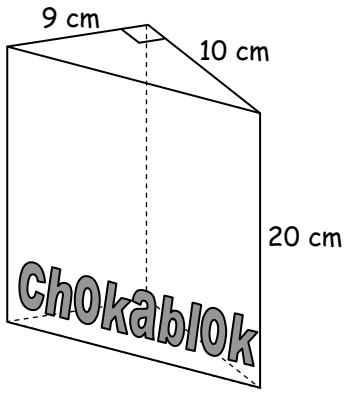
Mark

Q1. A rectangular tank is 1·5 m long, 30 cm broad and 20 cm high.
How many **litres** of water can it hold?

Q2. A window is in the shape of a rectangle 4m by 2m with a semicircle of diameter 4m on top.
Find the area of glass in the window.



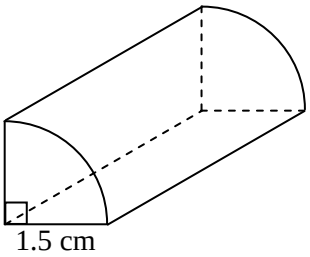
Q3. **a**. A box of chocolates is in the shape of a triangular prism. Calculate its volume.



b. The box contains 63 chocolates each with a volume of 4 cm^3.
What percentage of the volume of the box is unused?

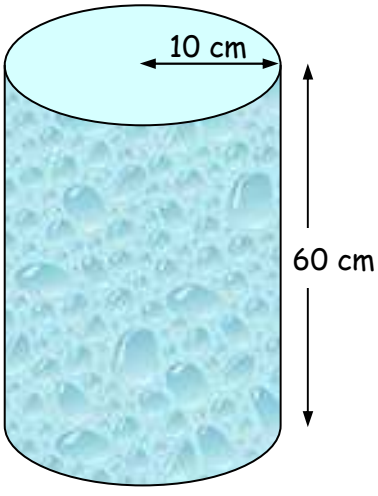
Q4. A cylindrical tin holds a litre of liquid and has a diameter of 7 cm.
Calculate its height.

Q5.



The end of the wooden mouldings used to make a photograph frame is in the shape of a quarter–circle.
If a total length of 70 cm of mouldings is required for a frame, find the volume of wood used.

Q6. Mrs Gamp is going to cover the **curved surface** of a cylindrical umbrella stand with waterproof fabric. The radius is 10 cm and the height is 60 cm.
Calculate the area of material required, to the nearest square centimetre.



S3 Credit Homework
Factorising 1

Name

Class

Mark

Q1. Factorise:

a. $y^2 + 5y$

b. $6ax + 9a$

c. $x^2 + 6x + 9$

d. $w^2 - 64$

e. $k^2 + 5k - 6$

f. $x^2 - 10x - 24$

Q2. Factorise:

a. $4x^2 - 49$

b. $2c^2 + 5c + 2$

c. $12a^2 + 7a - 12$

d. $5x^2 - 8x - 4$

e. $4k^2 + 20k + 25$

f. $7w^2 - 2w - 9$

Q3. Fully factorise:

a. $5s^2 - 20$

b. $3m^2 - 6m - 9$

c. $12x^2 + 16x + 4$

S3 Credit Homework
Factorising 2

Name

Class

Mark

Q1. Factorise:

a. $2x^2 - 8x$

b. $x^2 + 10x + 25$

c. $3x^2 - 27$

d. $6x - 24x^3$

e. $2x^2 - 7x - 15$

f. $4x^2 - 11x + 6$

g. $3 - 3x - 36x^2$

h. $16x^2 + 10x - 6$

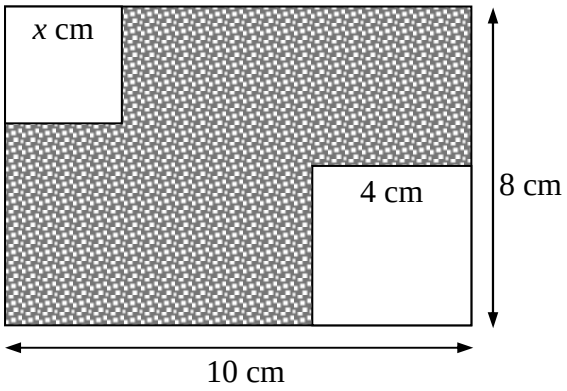
Q2. Fully factorise these expressions:

a. $(x + y)^2 - x^2$

b. $x^5 - 81x$

c. $a^2 + 3ab + 2b^2$

Q3.



A rectangular metal plate measuring 10 centimetres by 8 centimetres has two squares cut from it, one of side x cm and the other of side 4 cm.

Show that the remaining area of metal, A, (the shaded area) can be expressed as $A = (8 - x)(8 + x)$ square centimetres.

S3 Credit Homework
Personal Finance

Name

Class

Mark

Q1. Tony is paid a basic monthly salary of £450 plus commission of 12% of his total monthly sales.

Employee Number 0129	Employee Name **Tony Paterson**	Tax Code **342H**	Month 2
Basic Pay 450.00	Overtime –	Commission	Gross Pay
Income Tax 243.70	Pension	National Insurance 91.80	Total Deductions
			Net Pay

a. Calculate his **commission** in a month where his sales total £9000.
Write this in his pay-slip.

b. Calculate his **gross pay** and write it in the pay-slip.

c. Tony pays 8% of his salary into a pension fund. He also pays £91.80 National Insurance and £243.70 Income Tax this month.
Calculate his net pay for this month and complete the pay slip.

Q2. Use the following table to calculate how much tax Martin will pay with an annual salary of £25,400 and tax allowances of £6235.

Taxable Income (£)	0 to 4300	4301 – 27100	over 27100
Rates of Tax	Lower Rate 20%	Basic Rate 23%	Higher Rate 40%

Q3. The table below shows the monthly premiums per £1000 insured for a whole-life policy.

Age	**male**	**16 – 25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
	female	16 – 32	33	34	35	36	37	38	39
	non-smoker	2.70	2.70	2.80	2.80	3.00	3.10	3.20	3.35
	smoker	3.40	3.50	3.65	3.75	3.90	4.05	4.20	4.45

Calculate the monthly premium for

a. David, 29, smoker for £8000

b. Louise, 38, non-smoker for £5000

Q4. Calculate the total amount Eddie will have in his account after 3 years if he invests £1500 at the rate of 4% per annum.

Q5. Brenda buys a new car costing £12600. It depreciates in value by 30% in the first year and by 20% each year after that.
How much will she be able to trade it in for in 3 years time ?

S3 Credit Homework
Formulae

Name

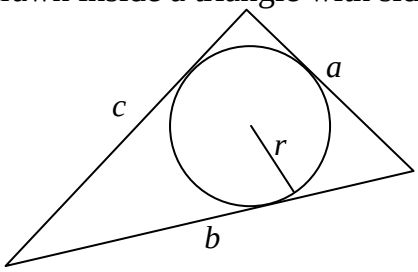
Class

Mark

Q1. Calculate the value of $\sqrt{(b^2 - 4ac)}$ when $a = 1$, $b = -6$ and $c = -7$.

Q2. A formula for finding total energy in Physics is $E = mgh + \frac{1}{2} mv^2$.
Find E if $m = 6{\cdot}4$, $g = 9{\cdot}8$, $h = 0{\cdot}5$ and $v = 0{\cdot}6$.

Q3. The radius, r, of a circle drawn inside a triangle with sides a, b and c as shown



can be found using the formula $r = \sqrt{\frac{(s-a)(s-b)(s-c)}{s}}$ where $s = \frac{1}{2}(a + b + c)$.

Calculate the radius of a circle which sits inside a triangle with sides 5 cm, 7cm and 8 cm.

Q4. $W^2 = b + \frac{10}{k}$ Change the subject of the formula to k.

Q5. Given that $A = \frac{b+c}{b}$, express b in terms of A and c.

Q6. **a**. A school tuck shop buys x boxes of crisps at £12.60 per box. Write down the total cost in pence in terms of x.

b. Each box contains 48 packets of crisps. The supplier also gives y free packets with **every** box bought.
If the crisps are sold at 30p per packet show that the total selling price can be written as
$30x(48 + y)$

c. Show that the profit, p,(in £s) can be written as $p = \frac{3x(6+y)}{10}$

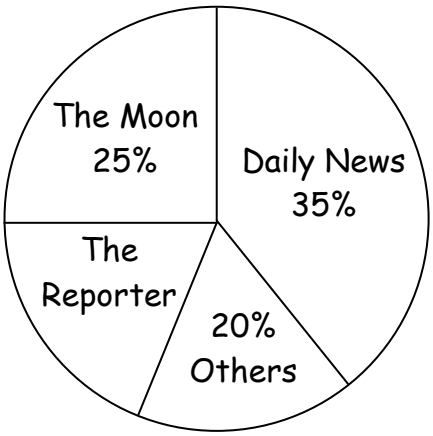
S3 Credit Homework
Statistics 1~ Graphs

Name

Class

Mark

Q1. The pie-chart shows the results when 120 people were askes which daily newspaper they read.

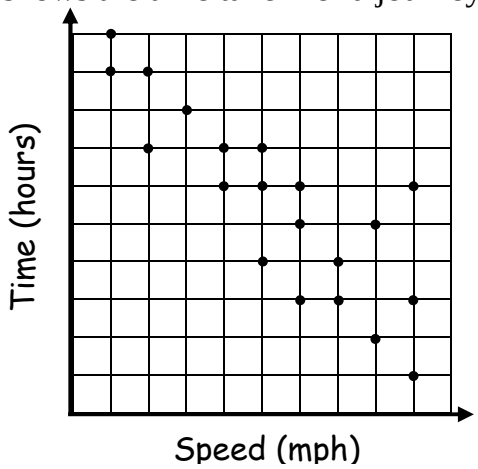


a. Which paper is the most popular?

b. What **percentage** read The Reporter?

c. **How many** people read the Daily News ?

Q2. The graph shows the time taken for a journey at different speeds.



Describe the correlation.

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

2	2	3	3					
3	0	1	1	6	7			
4	0	1	3	3	8	9		
5	0	0	1	2	4	5	6	9
6	0	0	1	1	7			
7	1	3	3					
8	0	6	8					

n = 33 2 | 1 represents 21

a. Write down

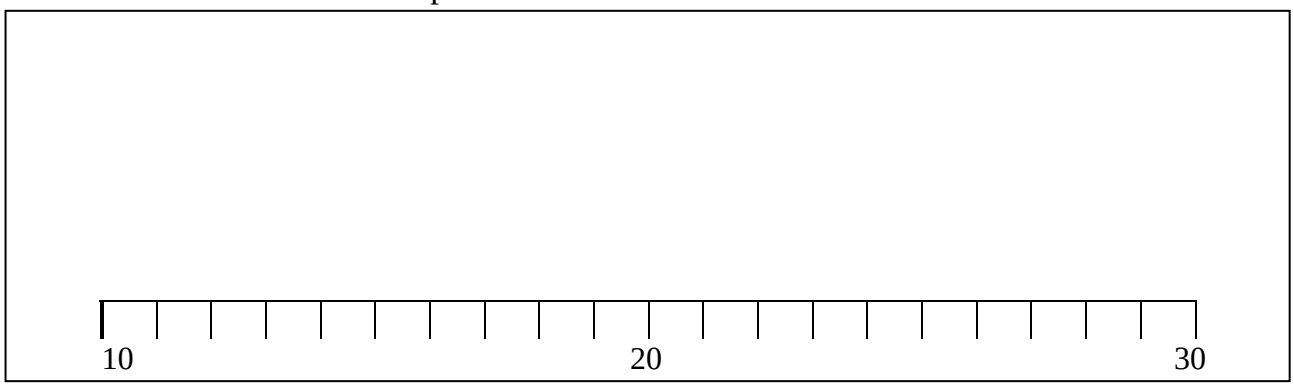
i. the median **ii**. the range **iii**. Q1 **iv**. Q3

b. What is the probability that a customer chosen at random has spent less than 30 pence?

Q4. A supermarket sells packs of strawberries. A spot check was carried out on 24 packs to check the number of strawberries in each pack.
The results of the inspection are shown in the table below.

27	24	15	20	21	23	22	25	16	24	23	23
22	16	17	22	21	25	24	22	18	21	23	21

a. Show these results on a dot plot.



b. Is the distribution symmetric, skewed or widely spread ?

Q5. The table below shows the weights in kilograms of a group of boys.
Show this information on a stem and leaf chart.

39	42	48	38	51	44
42	51	53	42	47	39
38	45	43	51	47	57
42	44	38	43	48	50
42	41	52	49	39	46

Q6. A company that manufactures shoelaces spot checks the length (in cm) of the laces. Here are the results for two different production lines.

Line A	26.8	27.2	26.5	27.0	27.3	27.5	26.1	26.4	27.9	27.3
Line B	26.8	26.7	27.1	27.0	26.9	27.0	27.3	26.9	27.0	27.3

a. Draw a box plot for line A.

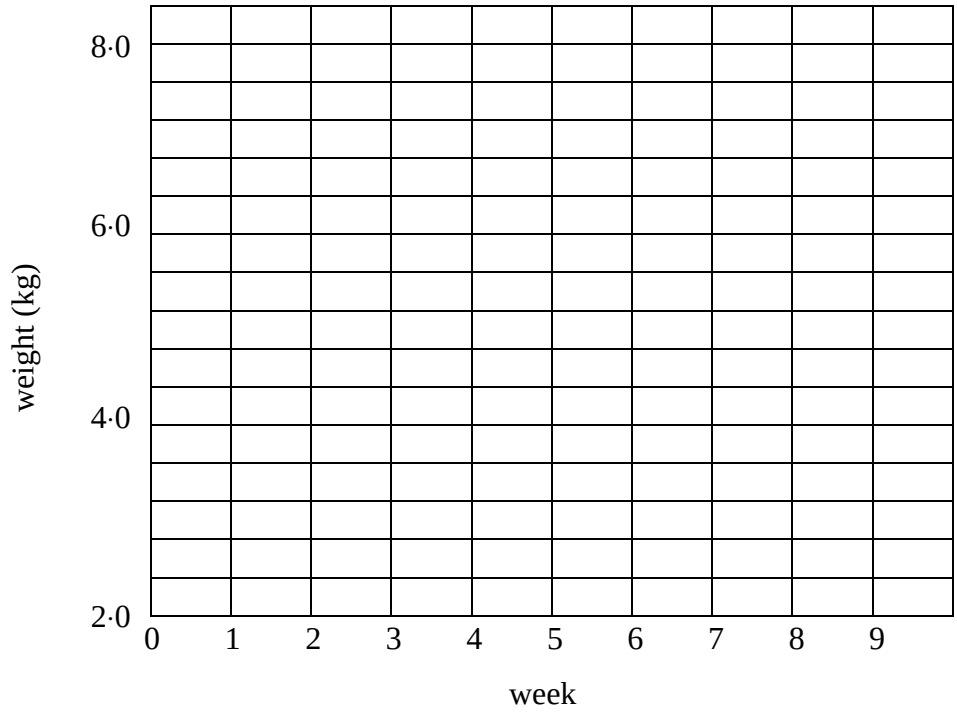
b. On the same diagram, draw a box plot for line B.

c. Which is the better production line ? (Give a reason for your answer)

Q7. The weight, in kilograms, of a baby each week for ten weeks is shown in the table below.

week	0	1	2	3	4	5	6	7	8	9
weight (kg)	3.60	3.50	4.05	4.95	5.15	5.75	6.00	6.50	6.50	7.15

Show this on a line graph



S3 Credit Homework
Statistics 2

Name

Class

Mark

Q1. The weights, in kilograms, of 20 new-born babies are shown below.

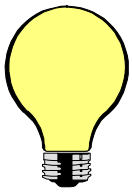
2.8	3.4	2.8	3.1	3.0	4.0	3.5	3.8	3.9	2.9
2.7	3.6	2.5	3.3	3.5	4.1	3.6	3.4	3.2	3.4

Find the **a**. median

b. mode

c. range.

Q2. 20 lightbulbs were tested to see how long they would last. The lifetimes of the bulbs are given below in hours.



1503	1469	1511	1494	1634	1601	1625	1492	1495	1505
1487	1493	1006	1512	1510	1599	1501	1486	1471	1598

The manufacturing company claims that the ***average*** lifetime of a lightbulb is 1500 hours. Do you agree with their claim?

Q3. A housing trust conducted a survey in a block of flats to find out how many people were living in each house. The results are shown below.

1	2	3	3	2	3	3	1	3	2	3	5
4	3	4	1	3	2	3	3	4	3	3	2

a. Complete the frequency table to show the results of the survey

number of people in flat	**frequency**	**cumulative frequency**
Total		

b. Add a cumulative frequency column to your table

c. Write down the median.

d. What is the modal number of people in a flat ?

Q4. The mean number of lengths of a pool completed by 8 members of a swimming team was 18. Seven of the totals are shown below

17 28 17 18 16 14 15

How many lengths were completed by the eighth member of the team ?

Q5. The weekly takings in small store, to the nearest £, for a week in December and March are shown below

December	2131	2893	2429	3519	4096	4810
March	1727	2148	1825	2397	2901	3114

a. Calculate the mean takings for December and March.

b. Comment on any differences.

Q6. The stem-and-leaf tables show the marks of a class of pupils in two maths tests.

paper 1

2	2					
3	0	3				
4	0	2	4			
5	1	1	1			
6	2	5	5	6		
7	0	0	1	5	5	
8	1	3	3	4	6	8
9	0	1	1	4	5	

paper 2

2	0	1	3				
3	0	2	3	4			
4	1	1	3	5	5		
5	2	4	5	5	8	8	9
6	0	1	4	5			
7	1	3	5				
8	3	7					
9	0						

a. For each paper, calculate the median and range.

b. In which paper did the pupils do better ?

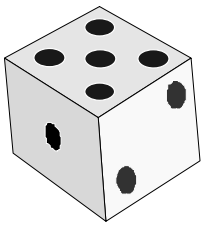
S3 Credit Homework
Probability

Name

Class

Mark

Q1. A die is rolled. Find the probability that it lands with



a. 1

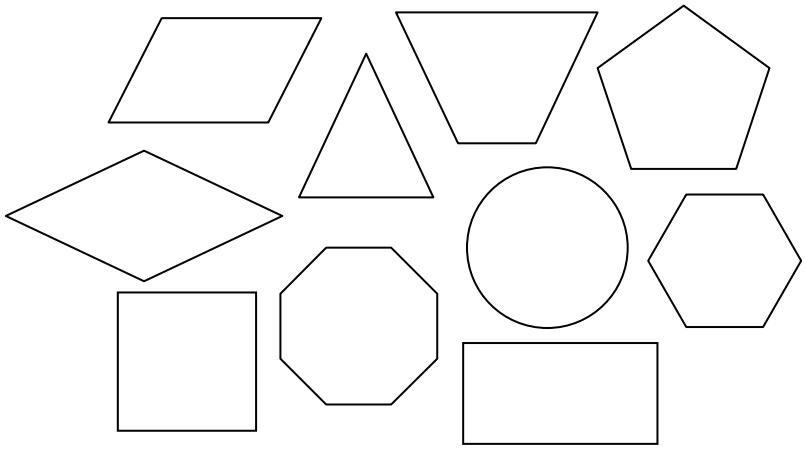
b. an odd number

c. a prime number

d. a multiple of 3

e. a number less than 3

Q2. If one of these geometric shapes is picked at random, what is the probability that it has



a. 4 sides

b. a centre of symmetry

c. less than 3 sides

Q3. Darren and his friend are playing with a pack of cards from which his maths teacher has confiscated the Ace of Spades and the King of Hearts.

What is the probability that the first card he deals is

a. an Ace?

b. a black card?

c. a Queen?

d. the 4 of clubs?