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S4 General Homework Exercise 1

1. Write each of these numbers to (i) 2 decimal places, (ii) 2 significant figures

(a) 4.98765 (b) 0.009872 (c) 983.678 (d) 0.015698

2. A journey lasts from 8.17am until 4.45pm. How long does it last?



3. A car travels 270km in 3 hours. What is its average speed?

4. If the interest rate is 5% per annum, how much interest is given on £300 for one year?

5. Plot the following pairs of points and then find the gradients of the line joining them

(a) A(2,1) B(5,6) (b) C(2,2) D(8,-2) (c) E(-3,-2) F(4,5)

6. What are the gradients of the lines with the following equations

(a) $y = 3x$ (b) $y = -2x$ (c) $y = 4x - 1$

7. Copy and complete the table for the line with equation $y = 2x + 2$ and then plot the points to draw the line.

x	-4	-3	-2	-1	0	1	2	3
y								

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S4 General Homework Exercise 2

1. Round the following to 1 decimal place

- (a) 3.5649 (b) 2.0578 (c) 3.946 (d) 9.9756

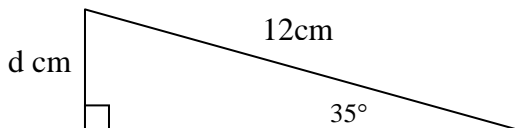
2. Calculate the following

- (a) 50% of 346 (b) 25% of 420 (c) 10% of 688 (d) 75% of 500

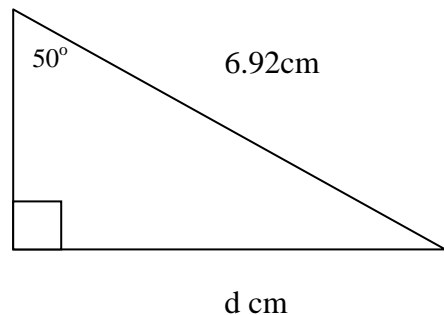
3. A is the point (3,2) and B is the point (8,6). Plot A and B and join them, then find the gradient of the line AB.

4. Use trigonometry to find the unknown lengths.

(a)



(b)



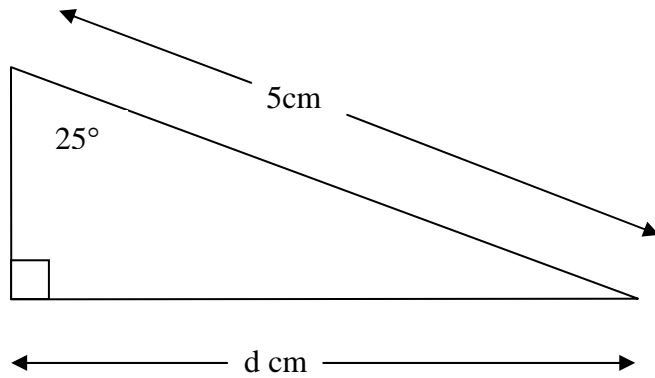
5. Complete the table and find the rule:

A	1	2	3	4	5		10
B	2	5					

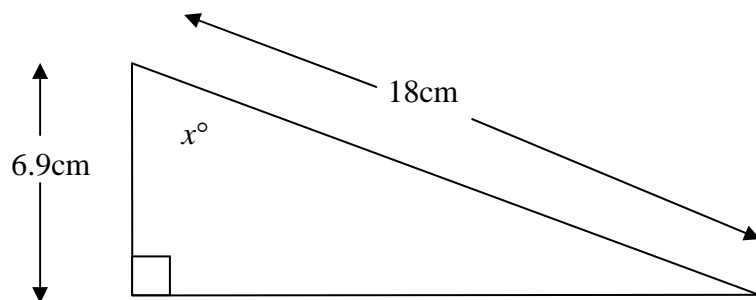
$$B = \underline{\quad} \times A + \underline{\quad}$$

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S4 General Homework Exercise 3

1. Calculate the length of d .



2. Find the value of x° .



3. Round the following to the nearest penny

(a) 22.7p (b) 45.3p (c) £3.237 (d) £4.494

4. Break the brackets and simplify if required:

(a) $3(x - 7)$ (b) $5(d + 2e)$ (c) $2(x - 4) + 9$ (d) $5 + 2(k + 6)$
(e) $8(t - 2) + 3t$ (f) $9(g - 3) + 12$ (g) $4 + 3(f - 1)$ (h) $b(b - c)$

5. Solve the following equations:

(a) $3x - 5 = 22$ (b) $5x + 1 = 36$ (c) $4x - 5 = 3$

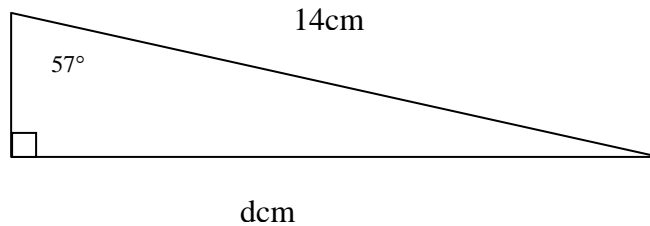
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S4 General Homework Exercise 4

1. The pilot knows that he can fly 1890km at an average speed of 630km/h. How long will the flight take?
2. Alan works in a shoe repair shop. His basic pay is £7.40 an hour. His overtime rates are: weekday, time-and-a-quarter; Saturday, time-and-a-half; Sunday, double time. Calculate his overtime pay for:

(a) 1 hour on Tuesday (b) 3 hours on Saturday (c) 7 hours on Sunday

3. Plot the points A(2,3) and B(6,9). Join the points and find the gradient of the line AB.

4. Find the length of d.



5. If $u = 3, v = 2, w = 1$, find the value of

(a) $u + v + w$ (b) uvw (c) u^2 (d) v^2
(e) w^2 (f) $2u + v$ (g) $3v - w$ (h) $(uvw)^2$

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S4 General Homework Exercise 5

1. Solve the following equations:

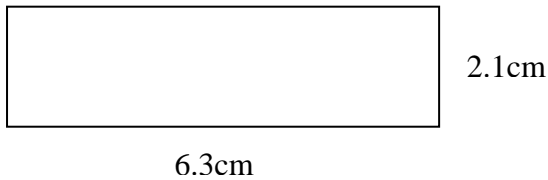
(a) $5x - 3 = 37$

(b) $4x + 7 = 21$

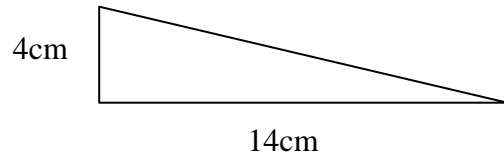
(c) $7x - 6 = 57$

2. Find the area of the following:

(a)



(b)



3. What is the circumference and area of a circle with diameter 40mm?

4. Mr. and Mrs. Jones buy a house for £90,000. If they pay a deposit of 10%, how much of a loan do they need to get from the bank?

5. Calculate the following:

(a) $-3 + (-4)$

(b) $10 - (-6)$

(c) $1 + (-4) - (-8)$

(d) $4x + (-5x)$

(e) $-3x^2 - (-4x^2)$

(f) $y^3 + (-2y^3)$

6. A car travels 12,000 miles in a year.

(a) If it can travel 30 miles on a gallon of petrol, how many gallons will it need for the year?

(b) What is the total petrol bill for the year if it costs £2.50 a gallon?

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S4 General Homework Exercise 6

1. Round the following to 2 decimal places:

(a) 3.36524

(b) 2.124879

(c) 3.9968

(d) 4.26512

2. Round the following to 2 significant figures:

(a) 256400

(b) 32410

(c) 0.012457

(d) 0.0002087

3. Change the following to hours (eg. 3hrs 30mins = 3.5hrs):

(a) 2hrs 15mins

(b) 1hr 45mins

(c) 4hrs 12mins

(d) 7hrs 48mins

4. If a car travels at an average speed of 56mph for 5 hours, how far will it have travelled?

5. A ladder 3.6m long is leaning against a wall. It makes an angle of 62° with the ground. Draw a triangle to illustrate this and use trigonometry to find how far up the wall the ladder reaches.

6. Solve the following equations:

(a) $3x - 4 = 23$

(b) $2(x + 3) = 26$

(c) $4(x - 1) = 20$

(d) $2x + 8 = x$

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S4 General Homework Exercise 7

1. Calculate the following, showing all your working eg. 17% of 250
 $= 0.17 \times 250$
 $= 42.5$

(a) 13% of 625 (b) 28% of 750 (c) 65% of 380 (d) 9% of 278

2. Write in standard form (eg. $2450000 = 2.45 \times 10^6$)

(a) 36000 (b) 46700000 (c) 0.0000354 (d) 0.00203

3. (a) Complete the table for the line $y = 3x$:

x	-1	0	1	2	3
y					

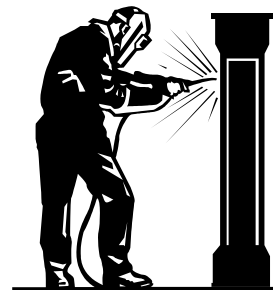
(b) Plot the points and join them to make a straight line

(c) What is the gradient of the line?

4. Write out the three formula for sin, cos and tan.

5. Joe gets paid £6.80 per hour and is paid time and a half for
How much does he get paid for:

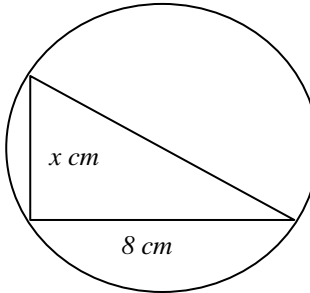
(a) 1 hour overtime
(b) 5 hours overtime



overtime.

6. Draw a rectangle and indicate on it equal sides, parallel sides and axes of symmetry.

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S4 General Homework Exercise 8

1. Calculate the following without the use of a calculator. All working must be shown.
- (a) 40% of 340 (b) $5.6 - 13.5 + 8.9$ (c) $2 + (-4) + (-5) + 7 + (-9)$
- (d) 7% of 564 (e) 67×24 (f) $2001 - 189.6$
2. Write these to (i) 2 decimal places (ii) 2 significant figures
- (a) 8.654 (b) 12.904 (c) 1032.456 (d) 0.00675
3. Kirsty's car is serviced every 12,000 miles. The car's mileage is 43,242. Calculate the number of miles :
- (a) Since her last service.
- (b) Till the next service.
4. If the diameter of this triangle is 10cm, calculate the third side in this triangle, x cm.
- 
5. Solve the following:
- (a) $x + 3 \geq 9$ (b) $2x - 3 \leq 11$ (c) $3x + 4 > 22$

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S4 General Homework Exercise 9

1. John cycles 15km in 25 minutes, and then walks 3km in 50 minutes.
Calculate:

- (a) The total distance he goes, and the time he takes
(b) His average speed from start to finish.



2. Jill sells cars. Her salary is £6000 per annum, plus 8% commission on sales. Her sales for the year come to £200,000. Calculate her total earnings for the year.
3. Join up the following pairs of points and calculate the gradients.
(a) A(2,5) B(7,8) (b) C(1,9) D(5,2) (c) E(4,5) F(8,5)
4. If an insurance company charges £4.75 per £1000 of contents insured, how much would it cost to insure contents worth £38,000?
5. Using trigonometry, calculate the sizes inside a right angled triangle with sides of length 5cm, 12cm and 13 cm.
6. Calculate the mean, median, mode and range of 2,4,7,5,9,6,4,3,2,3,10.

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S4 General Homework Exercise 10

1. Solve the following equations:

(a) $3x - 7 = 20$

(b) $4(x + 5) = 44$

(c) $2(x - 3) = 18$

(d) $5x - 8 = 12$

(e) $7(x - 4) = 0$

(f) $3(2x - 1) = 3$

2. Divide:

(a) £12 in the ratio 1:3

(b) £36 in the ratio 4:5

(c) £100 in the ratio 3:7

3. Twenty books cost £200. Find the cost of:

(a) 1 book

(b) 15 books

4. Joe walks 16km in 4 hours. At the same speed, how far would he walk in:

(a) 1 hour

(b) 2 hours

(c) 7 hours

5. If $a = 2, b = 3, c = 5$, calculate:

(a) $2ab$

(b) abc

(c) ab^2

(d) $3c - a^2$

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S4 General Homework Exercise 11

1. Change the following:

(a) 8.25km to m

(b) 0.06km to m

(c) 206cm to m

(d) 4.03kg to g

(e) 3km 25m to m

(f) 3250ml to litres

(g) 8320mm to m

(h) 900mm to m

(i) 225g to kg

2. Find:

(a) $\frac{3}{5}$ of 255

(b) $\frac{2}{7}$ of 77

(c) $\frac{5}{9}$ of 144

(d) $\frac{5}{6}$ of 102

3. George earns £120 per week. This year he received a 3% pay rise. Calculate:

(i) his rise

(ii) his new weekly wage.

4. Draw the graph and find the equation ($C = \text{---} N$).

Number of Books (N)	1	2	3	4	5
Cost in £ (C)	7	14	21	28	35

5. Factorise the following:

(a) $5x - 30$

(b) $6y - 27$

(c) $4d + 18$

(d) $3x^2 + 12x$

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S4 General Homework Exercise 12

1. The largest loch in Scotland is Loch Ness, it has a volume of approximately 7,443,000,000 cubic metres.

Write this number in scientific notation.

2. In electrical equipment, the current (C amps) varies directly as the power rating (P kilowatts). If a 3-kilowatt kettle takes a current of 12.5amps, how many amps does a 1.2 kilowatt grill take?

3. For safety reasons the weight of a caravan should not be more than 85% of the car towing it. Would it be safe for a car weighing 916 kilograms to tow a caravan of 750 kilograms?

Explain your answer.

4. Three friends set off on an 820-kilometre journey. They travel at an average speed of 80 kilometres per hour. How long will the journey take? (Give your answer in hours and minutes).

5. The greatest temperature change in a day was recorded at Tummel Bridge, Perthshire on 9th May 1978.

The temperature changed from -7°C to 22°C .

By how many degrees did the temperature change?

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S4 General Homework Exercise 13

1. Find:

(a) 37% of 256

(b) 67% of £42.87

(c) 89% of 256.98

2. A washing machine costs £240. A 5% discount is offered. Calculate:-

(a) The discount.

(b) The sale price.

3. Stan Speedie is attempting to run the mile in under 4 minutes. His quarter-mile lap times are: 59.72, 61.43, 62.09 and 56.13 seconds. Does he succeed? By how many seconds does he succeed or fail?



4. (a) Share 80p in the ratio:

(i) 3:5

(ii) 4:1

(b) Mrs Khan paid £43.62 for six rolls of wallpaper. How much would she have paid for eight rolls?

5. An oil tank in the shape of a cuboid is 250cm long, 180cm broad and 120cm high.

(a) Calculate the volume of the tank in cm^3 .

(b) How many litres can it hold? (1 litre = $1000cm^3$)

6. Solve the following equations and inequations:

(a) $3x - 5 = 28$

(b) $4(2x + 1) = 36$

(c) $3(3x - 2) = 21$

(d) $5x - 4 \geq 31$

(e) $2(x - 1) \leq 16$

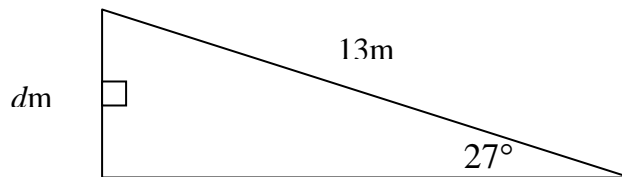
(f) $6x + 3 > 33$

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S4 General Homework Exercise 14

1. (a) On squared paper plot the points A(4,1), B(6,3) and C(4,5)
(b) Mark the point D so that ABCD is a square and write down the coordinates of D.
2. Change the following to standard form:
(a) 38,000 (b) 0.000045 (c) 2,520,000,000 (d) 0.00005
3. Change the following times to hours eg. 3hrs 15mins = 3.25hrs
(Remember: $24\text{mins} = 24 \div 60 = 0.4\text{hrs}$)
(a) 48mins (b) 1hr 18mins (c) 3hrs 24mins (d) 5hrs 57mins

4. Solve:
(a) $3x - 2 \geq 16$ (b) $2(x - 1) \leq 26$ (c) $3(2x + 1) > 57$

5. Find the length dm .



6. Find the third side of a right angled triangle if the longest side is 34cm and one of the shorter sides is 27cm.

S4 General Homework Exercise 16

1. Solve the following equations:

(a) $7x = 3x + 24$

(b) $14x = 9x + 55$

(c) $3x + 1 = x + 9$

(d) $4x - 16 = 2x$

(e) $3x + 12 = x$

(f) $5x - 3 = 2x + 15$

2. The Johnstons insure their house for £80,000 and its contents for £20,000. The insurance rates are £1.90 per £1000 for the house and £9 per £1000 for the contents. Calculate their:

(a) House insurance premium

(b) Contents premium

(c) Total premium

3. Calculate:

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

(b) $\frac{5}{9} + \frac{1}{4}$

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

(d) $\frac{5}{6} \div \frac{8}{9}$

4. John takes $1\frac{1}{2}$ hours to travel a distance of 130 km. Calculate his average speed.

5. Sadie wants to record two programmes on television. The first programme starts at 7.30pm for 1 hour 10 minutes. The second programme starts at 10.20pm for 2 hours 5 minutes. Write the starting and finishing times of the programmes in 24 hour time.

6. If $x = 3$, $y = 2$ and $z = 4$, calculate:

(a) $x + y + z$

(b) xyz

(c) $3y - z$

(d) $2xz + 4y$

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S4 General Homework Exercise 17

1. Round the following to the nearest pence:

- (a) £3.654 (b) 7.9087p (c) £12.0981 (d) 2.167p

2. Solve the following:

- (a) $3x - 2 \geq 25$ (b) $4(x - 2) \leq 16$ (c) $7x + 3 > 4x$ (d) $9x < 2x - 21$

3. Calculate the following:

(You may use a calculator, but show working)

- (a) 32% of 564 (b) 23% of 187 (c) 9% of 312 (d) 4.2% of 56.9

4. How long would Andrew's journey take if he travelled a distance of 320km at an average speed of 65km/h?

5. Write the following in standard form:

- (a) 2,350,000 (b) 698,000 (c) 0.000236 (d) 0.000000056

6. Write down all the different ways of arranging the letters *A, B* and *C*. Letters can be used more than once, eg. *ABB, CCB*.

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S4 General Homework Exercise 18

1. In a class of 30 pupils, 14 are boys and the rest are girls.

(a) What fraction of the class are (i) boys

(ii) girls

(b) What percentage are (i) boys

(ii) girls

2. A camera normally costs £140. The sale offers a 15% discount.

(a) How much is the discount?

(b) How much is the sale price of the camera?

3. A magazine increases its price from £3.60 to £4.50.
Calculate

(a) The increase in price

(b) The percentage increase in price.

4. At Pedal Power the cost of hiring a bike is £5 a day. Bike Hire charges £10 deposit and £3 a day.

(a) Copy and complete the following table:

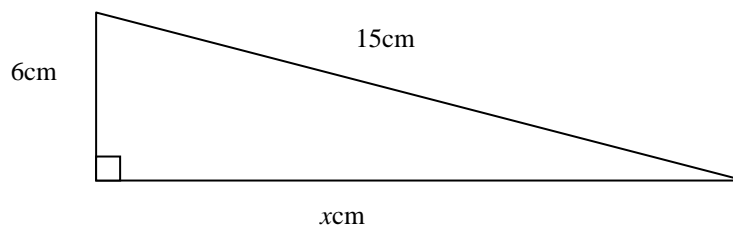
No. of Days	1	2	3	4	5	6	7	8
Pedal Power's Cost (£)	5	10						
Bike Hire (£)	13	16						

(b) Draw both lines on the same graph

(c) When are both costs equal

(d) Peter wants to hire a bike for 7 days. What advice would you give him?

5. Find the length of x .



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S4 General Homework Exercise 19

1. A shop has a sale with 15% off all stock. How much are the following after a discount?

- (a) £32 (b) £68 (c) £120 (d) £310

2. Copy and complete the table:

x	1	2	4		
$x + 3$	4			13	
$2x - 1$		3			

3. Calculate the following:

- (a) $\frac{2}{3} + \frac{3}{7}$ (b) $\frac{3}{5} - \frac{2}{7}$ (c) $3\frac{3}{8} + 2\frac{2}{3}$

4. An oil tank in the shape of a cuboid is 250cm long, 180cm broad and 120cm high.

- (a) Calculate the volume of the tank in cm^3 .
(b) How many litres can it hold?

5. Danielle has £125.60 in his bank account.

- (a) What will his bank balance be after £37.80 is withdrawn and £92.90 is put into the account?
(b) Calculate a year's interest on the new balance at 7% per annum.

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S4 General Homework Exercise 20

1. Calculate the following:

(a) $\frac{2}{3} + \frac{5}{7}$

(b) $\frac{5}{6} \times \frac{7}{8}$

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

(d) $4\frac{3}{7} - 2\frac{1}{4}$

2. Calculate the mean, median and mode of the following list of numbers:

4, 6, 8, 3, 1, 2, 13, 7, 1

3. Write the following numbers out in full:

(a) 4.3×10^5

(b) 7×10^{-5}

(c) 9.1×10^7

(d) 5.64×10^{-4}

4. If $a = 3$, $b = -2$ and $c = 4$, calculate:

(a) abc

(b) $a^2 + b$

(c) $c^2 - b$

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

5. A cyclist travels a distance of 45km at an average speed of 30km/h. How long does it take her?

6. Solve the following:

(a) $3x = x - 16$

(b) $2x + 1 \geq -1$

(c) $5(x - 1) \leq 2(x + 2)$

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S4 General Homework Exercise 21

1. Solve the following:

(a) $4x - 9 = 31$

(b) $6x = x - 35$

(c) $5x = 2(x - 6)$

2. Calculate:

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

(b) $6\frac{5}{7} - 4\frac{2}{5}$

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

3. Find the area and circumference of a circle with radius 15cm .

(Area of a circle = πr^2 , Circumference of a circle = πD)

4. Find the long side of a right angled triangle where the two short sides are 5cm and 12cm . (*Hint: Draw a triangle*)

5. Find the sizes of angles x , y and z given that:

$$\sin x = \frac{5}{8}$$

$$\cos y = \frac{9.3}{10.9}$$

$$\tan z = \frac{25}{15}$$

6. What is the volume of a cube with sides 4cm , 5cm and 6cm ?

7. Six books cost £27. Find the cost of eight copies of the book.

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S4 General Homework Exercise 22

1. Round the following to the nearest penny:
(a) £4.876 (b) £0.08498 (c) 69.327p (d) 2.9134p
2. Mrs. Peters pays her council tax in ten monthly instalments. Calculate each payment if her monthly charge is:
(a) £952 (b) £873 (to the nearest penny)
3. How many days are there from 14th March to 5th May, including both dates?
4. Jean pays for a television over 10 months using hire purchase. The total cost is £280 and she has to pay a 10% deposit. How much is her monthly payments?
5. Marks for a test were marked but still had to be sorted. Here are the marks:
12, 34, 43, 19, 25, 8, 29, 44, 27, 33, 22, 47, 35, 15, 37
19, 41, 27, 48, 19, 29, 38, 15, 7, 33, 21, 18, 41, 31, 25
- (a) Copy and complete this table.

Mark	1-10	11-20	21-30	31-40	41-50
Number					

- (b) Make a bar graph to illustrate the information in the table

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S4 General Homework Exercise 23

1. John won £4800 in a competition. He invested it in the General Building Society where he received interest of 10.5% per annum. He decided to uplift his balance after 6 months. How much was this? (3)
2. (a) Two boys are on a cycling holiday. They stop to have a look at their map to see the distance to the nearest Youth Hostel.
The distance on the map is 13 centimetres and the map has a scale of 1:250000.
What is the actual distance in kilometres? (3)
- (b) The boys stop to have a look at their map to see the length of a loch. The actual distance is 10 kilometres.
What is the distance on the map in centimetres? (3)
3. The planet Pluto is a distance of 5.9×10^9 kilometres from the sun and the speed of light is 3×10^5 kilometres per second.
Write these numbers out in full. (2)
4. A mineshaft 100 metres long goes down at an angle of 23° to the horizontal.
How far below the surface is the shaft? (4)

