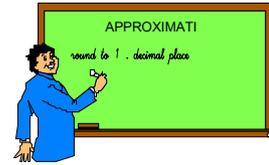


Rounding



1. Round each of the following numbers to the nearest 10.

- | | | | |
|---------|----------|---------|---------|
| (a) 26 | (b) 856 | (c) 492 | (d) 75 |
| (e) 561 | (f) 1242 | (g) 565 | (h) 798 |

2. Round each of the following numbers to the nearest whole number.

- | | | | |
|-----------|-----------|-----------|-----------|
| (a) 57.4 | (b) 8.61 | (c) 6.199 | (d) 14.57 |
| (e) 28.91 | (f) 341.8 | (g) 123.0 | (h) 9.099 |

3. Round each of the following numbers to 1 – decimal place.
(one number **after** the point)

- | | | | |
|------------|-----------|-----------|-----------|
| (a) 26.32 | (b) 8.48 | (c) 34.71 | (d) 2.64 |
| (e) 14.79 | (f) 23.85 | (g) 39.63 | (h) 7.67 |
| (i) 29.33 | (j) 1.55 | (k) 68.70 | (l) 4.26 |
| (m) 123.97 | (n) 18.94 | (o) 4.51 | (p) 12.96 |

4. Round each of the following numbers to 2 – decimal places.
(two numbers **after** the point)

- | | | | |
|------------|-----------|------------|------------|
| (a) 36.344 | (b) 8.123 | (c) 3.786 | (d) 22.155 |
| (e) 4.719 | (f) 7.861 | (g) 14.659 | (h) 17.382 |
| (i) 6.237 | (j) 6.555 | (k) 1.786 | (l) 9.270 |
| (m) 13.697 | (n) 8.994 | (o) 17.595 | (p) 2.906 |

Calculations & Rounding

**** You need a calculator for this worksheet.**



1. Calculate each of the following rounding your answers to **1 – decimal place**.

a) 2.31×6.4

b) $18 \div 7$

c) 12.9×0.13

d) 4.7×4.7

e) 5.23^2

f) $\frac{16 \times 5.3}{1.9}$

2. Calculate each of the following rounding your answers to **2 – decimal places**.

a) 2.562×12.41

b) $79 \div 4.7$

c) 17.91×10.13

d) 8.12×8.12

e) 2.77^2

f) $\frac{23 \times 1.34}{3.2}$

3. Change each of the following *fractions* to *decimal fractions* rounding your answers to **2 – decimal places**.

a) $\frac{3}{7}$

b) $\frac{11}{19}$

c) $\frac{23}{41}$

d) $\frac{1}{13}$

4. Round each of the following calculations to the nearest £1 .

a) $£17 \div 4$

b) $£233 \div 9$

c) $£45 \div 11$

d) $£167 \div 13$

5. Round each of the calculations in question 4 to the nearest penny (1p).

6. A man pays 7 boys £31 for digging his garden. The boys divide the money equally between themselves.

a) How much money, to the nearest penny, can each boy get ?

b) How much money is left that can't be divided ?



Squares and Square Roots

**** You need a calculator for this worksheet.**



1. Find the value of each of the following , rounding your answers to 2 - decimal places .

a) $\sqrt{8}$	b) $\sqrt{23}$	c) $\sqrt{120}$	d) $\sqrt{13}$
e) $\sqrt{3}$	f) $\sqrt{45}$	g) $\sqrt{235}$	h) $\sqrt{1230}$
i) $\sqrt{8 \cdot 9}$	j) $\sqrt{29 \cdot 6}$	k) $\sqrt{0 \cdot 7}$	l) $\sqrt{39 \cdot 2}$

2. Find the value of each of the following , rounding your answers to 3 - decimal places .

a) $\sqrt{17}$	b) $\sqrt{288}$	c) $\sqrt{3478}$	d) $\sqrt{23 \cdot 6}$
e) $\sqrt{85}$	f) $\sqrt{341}$	g) $\sqrt{31}$	h) $\sqrt{674}$

3. Calculate the value of x in each of the following , rounding off your answers to 2 - decimal places where necessary .

a) $x^2 = 3^2 + 4^2$	b) $x^2 = 10^2 + 24^2$
c) $x^2 = 2^2 + 7^2$	d) $x^2 = 12^2 + 4^2$
e) $x^2 = 20^2 + 15^2$	f) $x^2 = 14^2 + 9^2$
g) $x^2 = 5^2 - 2^2$	h) $x^2 = 17^2 - 14^2$
i) $x^2 = 2 \cdot 3^2 + 1 \cdot 8^2$	j) $x^2 = 6 \cdot 7^2 - 3 \cdot 8^2$
k) $x^2 = 0 \cdot 8^2 + 1 \cdot 1^2$	l) $x^2 = 1 \cdot 3^2 - 0 \cdot 7^2$
m) $x^2 = 4 \cdot 9^2 - 4 \cdot 1^2$	n) $x^2 = 7 \cdot 3^2 + 9 \cdot 2^2$

** show your working*

$$\begin{aligned}
 x^2 &= 7^2 + 3^2 \\
 &= 49 + 9 \\
 &= 58 \\
 x &= \sqrt{58} \\
 &= 7.62
 \end{aligned}$$



Standard Form

1. Express each of the following numbers in standard form :

- | | | |
|--------------------|---------|----------|
| (a) 234 000 | (b) 650 | (c) 8700 |
| (d) 12 000 000 000 | (e) 43 | (f) 9.21 |

2. Write each of the following as an ordinary number :

- | | | |
|-----------------------|------------------------|-------------------------|
| (a) 2.4×10^2 | (b) 3.61×10^1 | (c) 7.003×10^4 |
| (d) 5.8×10^7 | (e) 6.04×10^3 | (f) 2×10^0 |

3. Express each of the following numbers in standard form :

- | | | |
|------------|-------------------|----------------|
| (a) 0.0045 | (b) 0.0304 | (c) 0.00000005 |
| (d) 0.86 | (e) 0.00000000089 | (f) 0.000345 |

4. Write each of the following as an ordinary number :

- | | | |
|--------------------------|----------------------------|---------------------------|
| (a) 8.7×10^{-3} | (b) 3.92×10^{-1} | (c) 2.07×10^{-6} |
| (d) 7.8×10^{-2} | (e) 6.005×10^{-4} | (f) 5×10^{-5} |

5. (a) The distance between the planet Earth and the sun is a mere 93 000 000 miles.
Write this number in standard form.

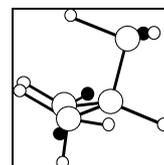


- (b) Jupiter's closest satellite is called Amalthea and is about 112 000 miles from the centre of the planet.
Write this distance in standard form.

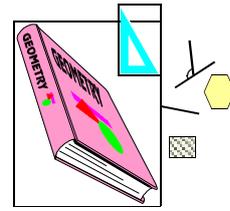


- (c) The average distance from the sun to the planet Pluto is 3.7×10^9 miles.
Write this distance as an ordinary number.

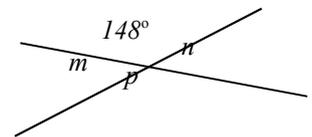
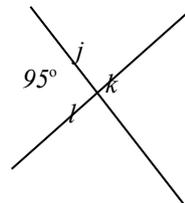
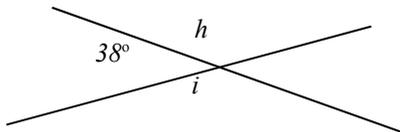
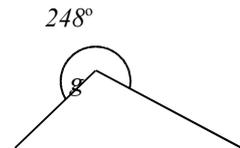
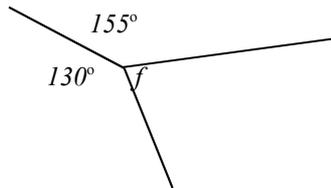
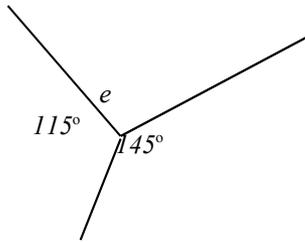
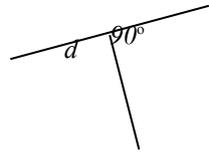
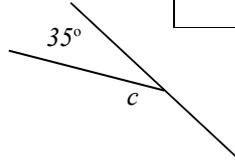
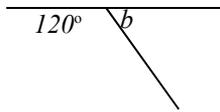
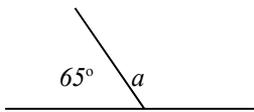
- (d) The coefficient of linear expansion of brass is 1.9×10^{-7} per degree centigrade.
Write this coefficient as an ordinary number.



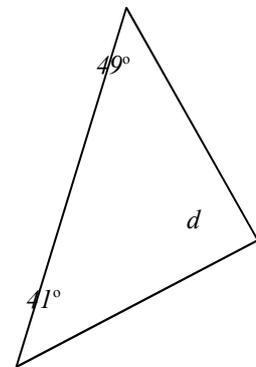
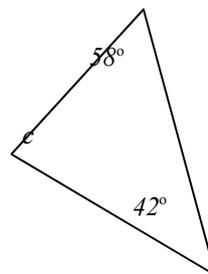
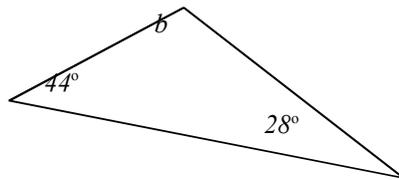
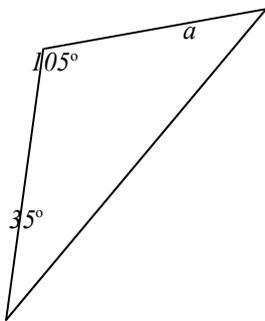
Angles and Triangles



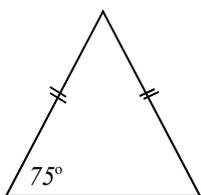
1. Calculate the size of each lettered angle below :



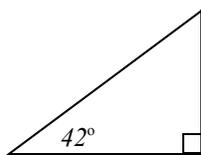
2. Calculate the size of each missing angle in the triangles below :



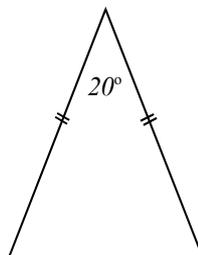
3. Copy each triangle below and fill in all the missing angles :



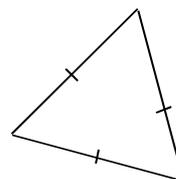
(a)



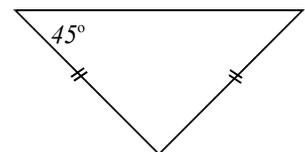
(b)



(c)



(d)



(e)

Shapes and Coordinates

You need a ruler for this worksheet.



1. (a) Plot the points $A(2,2)$, $B(7,2)$ and $C(7,7)$ on a coordinate diagram.
 (b) Given that ABCD is a **square**, complete the diagram and write down the coordinates of the point D.

2. (a) On a coordinate diagram plot the points $P(1,3)$, $Q(8,3)$ and $R(8,6)$.
 (b) Given that PQRS is a **rectangle**, complete the diagram and write down the coordinates of the point S.

3. (a) On a coordinate diagram plot the points $E(2,4)$, $F(4,1)$ and $G(10,5)$.
 (b) Given that EFGH is a **rectangle**, complete the diagram and write down the coordinates of the point H.

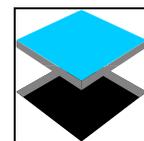
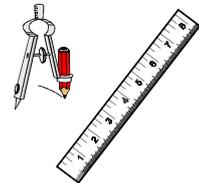
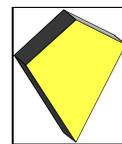
4. (a) On a coordinate diagram plot the points $T(4,2)$, $U(7,3)$ and $V(6,6)$.
 (b) Given that TUVW is a **square**, complete the diagram and write down the coordinates of the point W.

5. (a) Plot on a coordinate diagram the points $A(2,5)$, $B(-3,5)$ and $C(-3,-2)$.
 (b) Given that ABCD is a **rectangle**, complete the shape and write down the coordinates of D.

6. (a) Plot on a coordinate diagram the points $A(6,3)$, $B(3,5)$ and $C(-3,3)$.
 (b) Given that ABCD is a **kite**, complete the shape and write down the coordinates of the point D.

7. Repeat question 6. for the following sets of points :

- (a) $A(-1,5)$, $B(2,3)$ and $C(-1,-6)$.
- (b) $A(2,5)$, $B(6,3)$ and $C(2,-5)$.
- (c) $A(-2,-4)$, $B(1,3)$ and $C(5,3)$.



8. (a) Plot on a coordinate diagram the points $P(3,5)$, $Q(5,2)$ and $R(3,-1)$.
 (b) Given that PQRS is a **rhombus**, complete the shape and write down the coordinates of the point S.

Working with Percentages



1. Write each of the following percentages as a decimal fraction :

- a) 32% b) 87% c) 20% d) 8% e) 3% f) 90% g) 7% h) $12\frac{1}{2}\%$ i) $3\frac{1}{2}\%$

2. Calculate each of the following :

- a) 36% of £24.00 b) 56% of £3000 c) 18% of £340 d) 8% of £15
 e) 10% of £16.40 f) 86% of £12000 g) 20% of £34.50 h) 12% of £58
 i) 2% of £85 j) 9% of £16 k) $6\frac{1}{2}\%$ of £200 l) $12\frac{1}{2}\%$ of £120

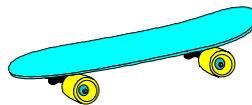
3. Calculate each of the following , rounding your answer to the nearest penny if necessary :

- a) 23% of £45 b) 17% of £23.50 c) 45% of £12.75 d) 14% of £8.65
 e) 3% of £24.34 f) 15% of £4.95 g) 8% of £8.50 h) 26% of £3.48
 i) 16% of £340.10 j) 4% of £12.43 k) 78% of £13.93 l) 67% of £1.89
 m) 18% of 94p n) 23% of £0.47 o) 5% of 23p p) 76% of 94p

4. The following items are to be reduced in price by 10% for a sale.
 Calculate the sale price of each item :



Clock Radio
£35



Skate Board
£24



Yo Yo
£12



Video Camera
£462



CD Player
£123.70



Cool Shades
£16.50

5. Increase the price of each item above by 8%.

Wages and Salaries



Round all answers to the nearest penny where necessary

1. Calculate
- i) The weekly pay
 - ii) The annual pay (to the nearest pound) of each person below :

- a) Susan works a 40 hour week and gets paid £3.48 per hour.
- b) John gets paid £5.10 per hour and works a 35 hour week.
- c) Mark has an hourly rate of £7.85 and works a 44 hour week.
- d) Helen works a total of 28 hours each week and is paid £4.25 per hour.



2. For each person below calculate
- i) their weekly pay
 - ii) their hourly rate of pay.

- a) Tom earns £15400 per year and works a 38 hour week.
- b) Jane works 30 hours each week and has an annual salary of £18560.
- c) Brian has an annual salary of £26800 and works 42 hours each week.
- d) Andrea works 46 hours every week and has an annual salary of £28300.



3. Overtime is paid at "time-and-a-half" (1.5 times normal rate of pay).

- a) Graeme is paid £4.85 per hour and works a 40 hour week. How much will he earn in a week where he works 46 hours ?
- b) Susan earns £3.20 per hour for a normal working week of 34 hours. How much will she be paid for working 38 hours one week ?
- c) One week Tom works his normal 35 hours and an extra 12 hours overtime. Calculate his pay for this week if his normal rate of pay is £8.40 per hour.
- d) In a particular week Michael works his normal 40 hours plus an extra 5 hours overtime. Calculate his pay for this week if his normal rate of pay is £6.35 per hour.

4. Steven works a 36 hour week. His normal rate of pay is £4.95 per hour.
Calculate his total pay for a week where he works his normal hours +

..... 4 hours overtime at "time-and-a-half" and 6 hours at "double-time"

5. Lucy works a 30 hour week. Her normal rate of pay is £3.50 per hour.
Calculate her total pay for a week where she works her normal hours +

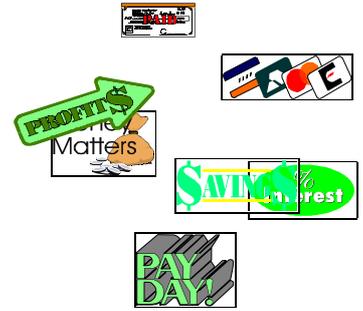
..... 8 hours overtime at "time-and-a-half" and 2 hours at "double-time"



Overtime and Commission

Overtime : Higher rates are paid to some workers who are prepared to work evenings or weekends.
The following rates apply for all the questions below :-

Evenings *time-and-a-half*
Saturdays *time-and-a-half*
Sundays *double-time*



1. a) Helen is paid a basic rate of £4.60 per hour and works a 36 hour week.
Calculate her total pay for the week she works

her basic 36 hours + 4 hours of evening work + 6 hours work on Sunday.

- b) John works a 40 hour week and is paid £5.20 per hour. Calculate his total pay for the week where he works an extra 8 hours on Saturday and 2 hours on Sunday.
- c) Susan works for an advertising agency and is paid £8.10 per hour.
Calculate her total pay for each of the following weeks

Week 1 - 30 basic hours + 5 hours on Saturday + 4 hours on Sunday.

Week 2 - 26 basic hours + 10 hours of evening work + 2 hours on Saturday.

2. Michael works for Bee and Queue and is paid £3.80 per hour.
He works a basic 5-day week from 9.30am until 5.30pm, Monday to Friday.
How much will Michael earn in the week where he works his normal week plus overtime from 10.00am until 4.30pm on Sunday ?

Commission : People who "sell" for a living are usually paid commission calculated as a *percentage* of their total sales.

3. Calculate the commissions on each sale below :
- a) 5% on a sale of £460 b) 3% on a sale of £1200 c) 10% commission on a sale of £625
4. Mr Greig is a door-to-door salesperson. He is paid a weekly wage of £140 plus a commission of 12% on his total weekly sales. How much will he earn in a week where his sales total £1050 ?
5. Miss Jones sells cars. She works a basic 38 hour week and is paid £3.45 per hour.
She is also earns a 2% commission on every car she sells.
Calculate her total pay for the week where she sells three cars totalling £14200 in value.

Savings and Interest



1. The Royal Bank of Scone has an interest rate of 4% p.a. (per annum).

How much interest would you receive on the following amounts of money at the end of 1 year ?

- (a) £600 (b) £1400 (c) £480 (d) £80.50

2. Pegasys Building Society has **three** different savings schemes. Each scheme has its own interest rate and a particular rule for withdrawing your money.

Super Saver Scheme : Interest 5% p.a. - monthly withdrawals allowed.

Bumper Savings Scheme : Interest 6% p.a. · 3 months notice of withdrawal.

- (a) How much interest would you receive in a year on :-
- (i) Savings of £750 in the "Bumper Scheme" ?
 - (ii) Savings of £2340 in the "FlexibleScheme" ?
 - (iii) Savings of £320 in the "Super Saver Scheme" ?
 - (iv) Savings of £8160 in the "Flexible Scheme" ?
- (b) John wants to split his savings of £1200 . He decides to put half in the "Super Saver Scheme" and half in "Flexible Savings. Calculate the total interest he will receive in a year from his two accounts.

3. Calculate the interest on :

- | | |
|-----------------------------------|------------------------------------|
| (a) £960 at 7% p.a. for 6 months. | (b) £1356 at 5% p.a. for 4 months. |
| (c) £440 at 3% p.a. for 2 months. | (d) £972 at 9% p.a. for 9 months. |
| (e) £3450 at 2% p.a. for 1 month. | (f) £576 at 2½% p.a. for 7 months. |

4. Mr White invests £3200 at 6% p.a. Five months later he decides to draw out his interest to help pay for a new camera. How much does he draw out ?



5. Miss Gray invests £1500 at 8% p.a. Eight months later she decides to lift out her interest to help pay for a night out. How much will she draw out ?



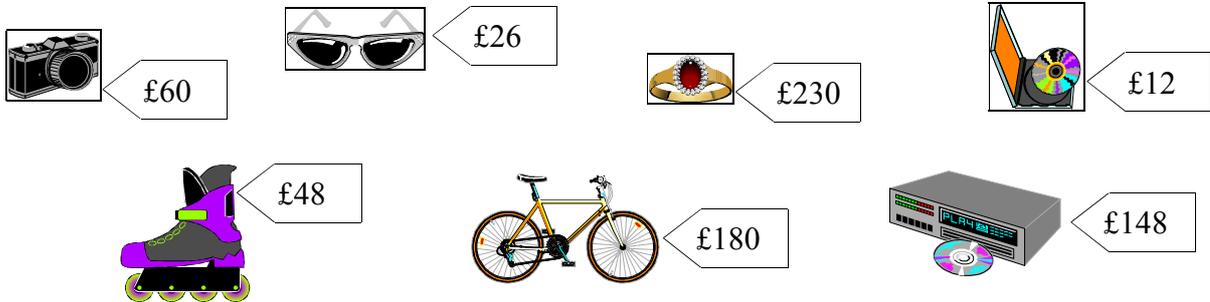
Value Added Tax (VAT)



Take $17\frac{1}{2}\%$ as the rate of VAT for all the following questions.

1. Calculate the VAT due on each item below :
 - (a) A cycle costing £80
 - (b) A stereo costing £130
 - (c) A toy costing £8
 - (d) A radio costing £82
 - (e) A gas bill costing £68
 - (f) A holiday flight costing £640

2. For each article below, calculate :
 - (a) the VAT
 - (b) the total cost.



3. Copy and complete the following bills :

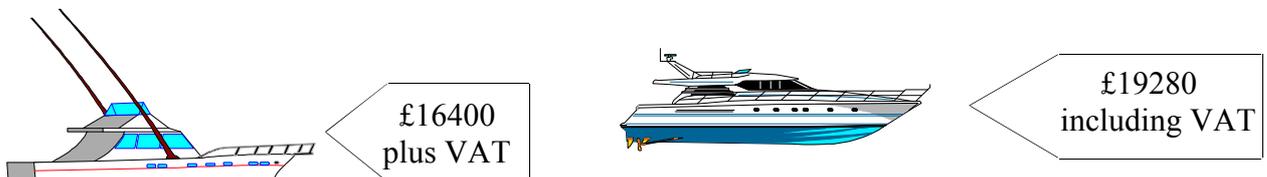
	£
6 dozen nails @ £0.80 per doz.	
5 tins of paint @ £4.60 per tin	
10 rolls of wallpaper @ £6.80 per roll	
Subtotal	
+ VAT @	
TOTAL	

(a)

	£
8 starters @ £2.40 each	
6 main courses @ £8.10 each	
8 sweets @ £3.60 each	
Subtotal	
+ VAT @	
TOTAL	

(b)

4. Which of these two boats is the cheapest to buy ?



Electricity Bills

Calculate the entries *A, B, C, D* and *E* for each bill below :

1.

<i>Plugs Electricity Co.</i>				
Meter Reading		Charges	Amount (£)	
Present	Previous	A units at 8.11p Standing Charge Subtotal VAT at 17.5% TOTAL	B 8.40 ----- C ----- D ----- E	
27458	27158			

2.

<i>Sparks Electricity Co.</i>				
Meter Reading		Charges	Amount (£)	
Present	Previous	A units at 6.31p Standing Charge Subtotal VAT at 17.5% TOTAL	B 10.40 ----- C ----- D ----- E	
58458	57123			

3.

<i>Pegasys Electricity Co.</i>				
Meter Reading		Charges	Amount (£)	
Present	Previous	A units at 8.48p Standing Charge Subtotal VAT at 17.5% TOTAL	B 8.72 ----- C ----- D ----- E	
27636	26992			

4.

<i>Fuse Electricity Co.</i>				
Meter Reading		Charges	Amount (£)	
Present	Previous	A units at 6.47p Standing Charge Subtotal VAT at 17.5% TOTAL	B 12.40 ----- C ----- D ----- E	
4762	4012			

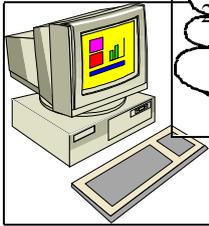
5.

<i>Shock Electricity Co.</i>				
Meter Reading		Charges	Amount (£)	
Present	Previous	A units at 9.32p Standing Charge Subtotal VAT at 17.5% TOTAL	B 8.63 ----- C ----- D ----- E	
27297	27200			

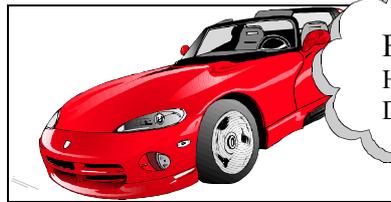
Hire Purchase



1. For each of the following , calculate :
- i) the total hire purchase price ;
 - ii) the difference between the HP price and the cash price.



Computer
 Cash : £780
 or Deposit of £50 +
 24 payments of
 £35

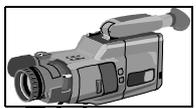


For Sale - £9000
 HP Terms
 Deposit £2000 + 36
 payments of £245

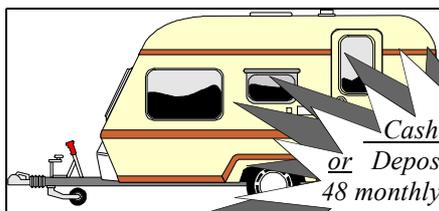


Cash £760 or
 £70 down + 18
 payments of £42

£350
 or Dep. £30
 + 9 payments
 of £40

Camera
 £675 or
 £28 down !
 + 12 instalments
 of £59.50



Cash £6450
or Deposit of 10% +
 48 monthly instalments
 of £136

HP Terms
 15% down plus
 30 £6.58



Cash £190

2. An electric guitar has a cash price of £340.

The hire purchase terms are

12% deposit + 24 monthly payments of £14.20

- (a) Calculate the total HP price.
- (b) How much would you save by paying cash ?

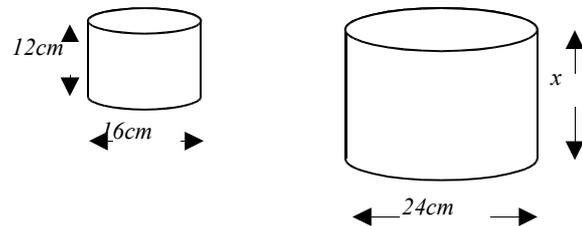
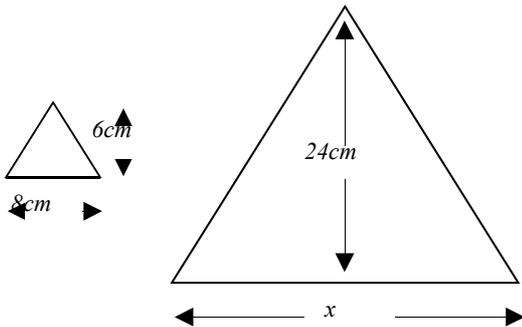
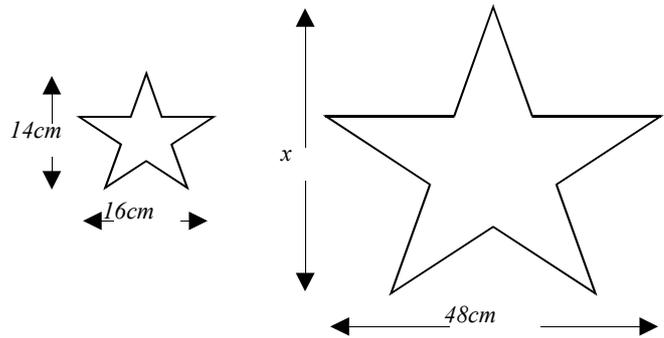
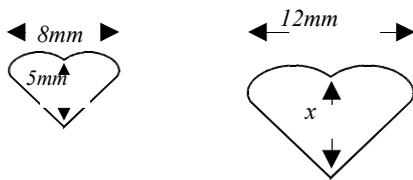
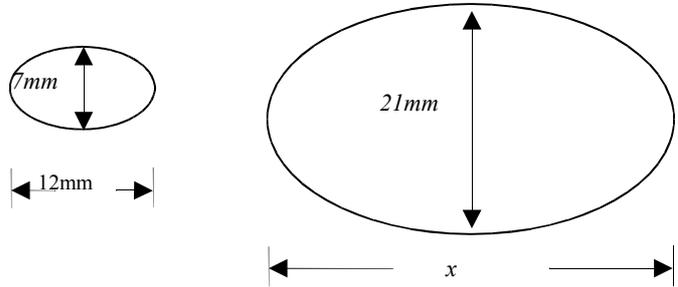
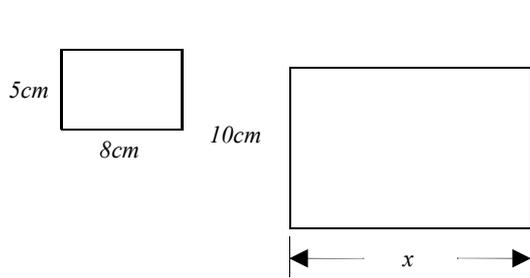


Scale Drawings



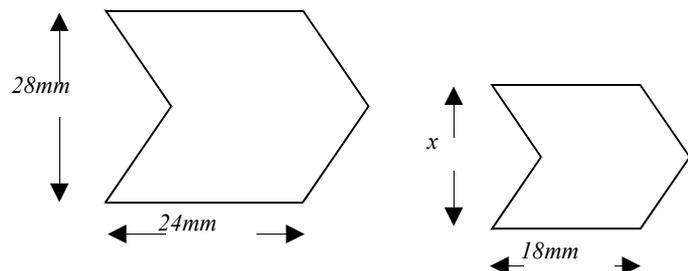
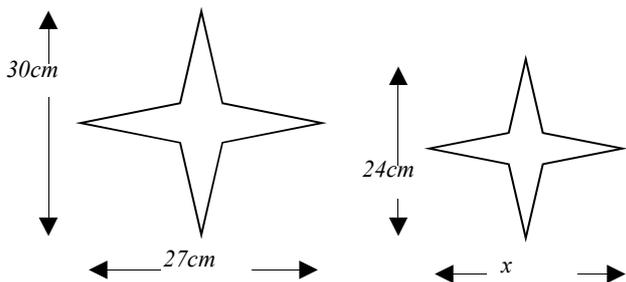
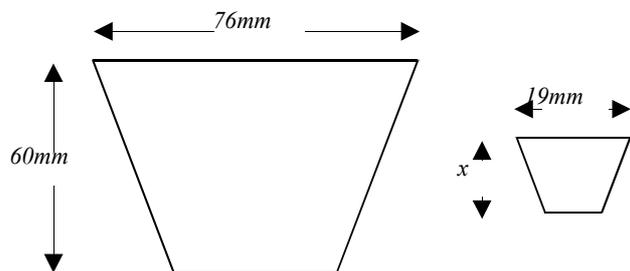
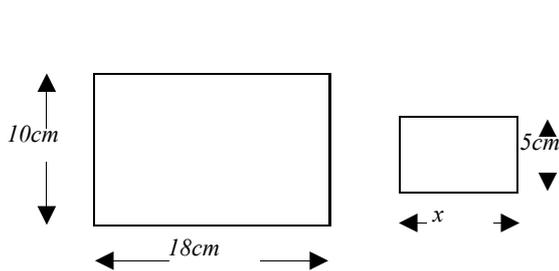
1. For each pair of pictures below

- i) State the enlargement scale factor (k).
- ii) Calculate the length marked x .



2. For each pair of pictures below

- i) State the reduction scale factor (k).
- ii) Calculate the length marked x .



Calculation of Distance

**** You need a calculator for this worksheet.**



REMEMBER

$$D = S \times T$$

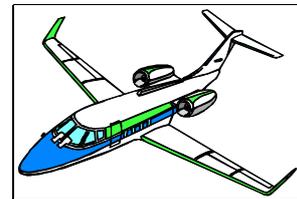
1. Calculate the distance travelled for each journey below. *Remember the working and the units !*

How far have you gone if you travel for

- (a) 4 hours at a speed of 50 km/h ?
- (b) 6 hours at a speed of 65 mph ?
- (c) $2\frac{1}{2}$ hours at a speed of 87 km/h ?
- (d) 40 minutes at a speed of 300 metres per minute ? (answer in kilometres)
- (e) 30 minutes at a speed of 48 mph ?

2. A plane flies at a maximum speed of 460 km/h.

- (a) How far will it travel in 7 hours at maximum speed ?
- (b) The pilot wants to fly to Rio a distance of 5900 km. Can he complete the journey within 13 hours ? Explain your answer.



3. A luxury cruiser has a maximum speed of 28 km/h.

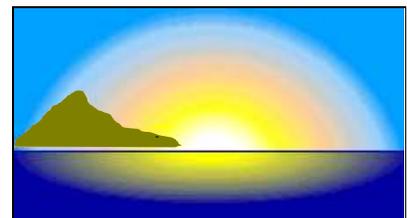
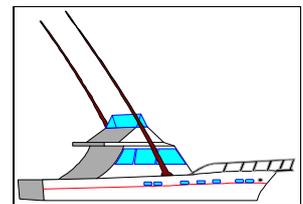
- (a) How far can the boat sail in $3\frac{1}{4}$ hours at top speed ?
- (b) On a journey from one island to another the cruiser has to navigate between two reefs, breaking the crossing into three stages.

Stage 1 : 2 hours at half-speed.

Stage 2 : $4\frac{1}{2}$ hours at full speed.

Stage 3 : 3 hours at one-quarter speed.

Calculate the total distance travelled on the journey.



Working with Time and Speed

1. Express each of the following in hours only, rounding your answers to 2 decimal places where necessary:
- | | |
|------------------------|------------------------|
| a) 4 hours 28 minutes | b) 5 hours 48 minutes |
| c) 40 minutes | d) 2 hours 6 minutes |
| e) 1 hour 18 minutes | f) 37 minutes |
| g) 12 hours 43 minutes | h) 7 hours 51 minutes |
| i) 2 hours 21 minutes | j) 22 hours 8 minutes |
| k) 9 hours 55 minutes | l) 17 hours 42 minutes |
- 2.
- a) A car travels a distance of 340 km in 4 hours 36 minutes. Calculate its average speed.
 - b) A plane travels a distance of 490 km in 1 hours 15 minutes. Calculate its average speed.
 - c) A car travels a distance of 58 miles in 48 minutes. Calculate its average speed.
 - d) A boat travels a distance of 86 km in 9 hours 6 minutes. Calculate its average speed.
 - e) A man runs a distance of 60 km in 5 hours 17 minutes. Calculate his average speed.
 - f) A boat travels a distance of 274 km in 1 days 3 hours 20 minutes. Calculate its average speed.
- 3.
- a) A man travels a distance of 340 km in his car. If the time taken for the journey is 5 hours 8 minutes, calculate his average speed for the journey.
 - b) A woman travels 54 miles to her work. She leaves home at 0910 and arrives at her work at 1015. Calculate the average speed for her journey.
 - c) A lorry driver leaves Manchester at 1420 and arrives in London at 1735.
 - i) How long did his journey take (in hours and minutes).

- ii) Calculate his average speed, to the nearest kilometre per hour, if the distance he travelled was 130 miles.

Calculation of Time

1. Express each of the following times in hours and minutes, rounding to the nearest minute where necessary :

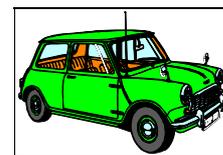
- | | |
|----------------|------------------|
| a) 2.4 hours | b) 3.6 hours |
| c) 1.35 hours | d) 8.33 hours |
| e) 9.21 hours | f) 4.75 hours |
| g) 12.5 hours | h) 3.18 hours |
| i) 6.123 hours | j) 18.457 hours |
| k) 2.32 hours | l) 5.64835 hours |



- 2.
- a) A car travels a distance of 340 km at an average speed of 64 km/h. Calculate the time taken for the journey, giving your answer to the nearest minute.
 - b) A plane travels a distance of 3123 km at an average speed of 278 km/h. Calculate the time taken for the journey, giving your answer to the nearest minute.
 - c) A car travels a distance of 58 miles at an average speed of 48 km/h. Calculate the time taken for the journey, giving your answer to the nearest minute.
 - d) A boat travels a distance of 186 km at an average speed of 18 km/h. Calculate the time taken for the journey, giving your answer to the nearest minute.
 - e) A man runs a distance of 32 km at an average speed of 20 km/h. Calculate the time taken for the journey, giving your answer to the nearest minute.
 - f) A boat travels a distance of 179 km at an average speed of 13 km/h. Calculate the time taken for the journey, giving your answer to the nearest minute.

3. a) A man travels a distance of 340 km in his car. If his average speed for the journey is 54 km/h, calculate the time taken for his trip to the nearest minute.

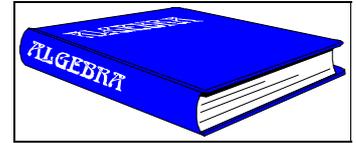
- b) A woman travels 34 miles to her work. Her average speed for the journey is 42 mph. Calculate the time taken to reach her work.



- c) A plane can fly at an average speed of 462 km/h. It flies from Glasgow to London, a distance of 598 km. Calculate the time taken for the flight, giving your answer to the nearest minute.

- d) A train leaves Edinburgh at 0915.
It travels the 180 km to Dundee at an average speed of 78 km/h.
At what time will it arrive in Dundee ?

Removing Brackets



1. Remove the brackets. For example $3(x+4) = 3x+12$

a) $4(c+2)$	b) $2(e+4)$	c) $5(f+6)$	d) $3(t+8)$
e) $7(g+3)$	f) $9(w+1)$	g) $6(h+6)$	h) $8(p+2)$
i) $3(2+y)$	j) $7(1+k)$	k) $5(5+z)$	l) $4(7+u)$
m) $9(1+e)$	n) $3(2+w)$	o) $8(12+r)$	p) $10(7+m)$

2. Remove the brackets :

a) $5(3c+2)$	b) $2(2e+4)$	c) $6(4f+6)$	d) $3(2t+8)$
e) $2(8g+3)$	f) $6(4w+1)$	g) $7(5h+6)$	h) $8(3p+2)$
i) $3(2+2y)$	j) $7(1+9k)$	k) $5(5+10z)$	l) $4(7+7u)$
m) $9(1+3e)$	n) $3(2+6w)$	o) $3(12+2r)$	p) $4(7+5m)$

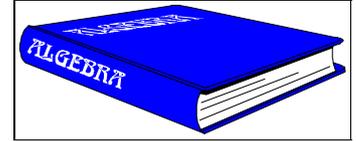
3. Expand these brackets :

a) $c(c+5)$	b) $e(e+2)$	c) $f(f+4)$	d) $t(t+7)$
e) $e(g+3)$	f) $p(w+1)$	g) $a(h+6)$	h) $r(p+2)$
i) $y(2+y)$	j) $c(1+k)$	k) $z(5+z)$	l) $h(7+u)$
m) $e(1+e)$	n) $p(2+w)$	o) $x(12+x)$	p) $m(7+m)$

4. Expand each of the following brackets :

- | | | | |
|-------------|-------------|-------------|-------------|
| a) $3(c-2)$ | b) $5(e-4)$ | c) $5(f+4)$ | d) $2(t-7)$ |
| e) $g(g-3)$ | f) $v(w+1)$ | g) $h(h-6)$ | h) $p(4-p)$ |
| i) $3(2-y)$ | j) $p(1-k)$ | k) $a(b+c)$ | l) $x(x-y)$ |

Simplifying Expressions



1. Write each of the following in a shorter form :

- | | | |
|---------------|---------------|---------------|
| a) $3x+2x$ | b) $4p+2p+6p$ | c) $8a-3$ |
| d) $5m+3m-2m$ | e) $3v+v$ | f) $4y+6y-y$ |
| g) $5a+4b+3a$ | h) $9f-4f+6$ | i) $8x+3+2x$ |
| j) $4c+6+3$ | k) $5m+3+4m$ | l) $4y+5+2y$ |
| m) $8+3x-4$ | n) $7d+6-3d$ | o) $5y+6z+y$ |
| p) $6a+5b-2a$ | q) $12+7x-7$ | r) $5g+6h+4g$ |
| s) $5r+8-2$ | t) $6x+3+3x$ | u) $8y-4+y$ |

2. Remove the brackets and simplify where possible :

- | | | | |
|----------------|----------------|-----------------|-----------------|
| a) $3(c+2)+7$ | b) $2(e+4)-5$ | c) $6(f-6)+2f$ | d) $4(t+8)-7$ |
| e) $7(g-3)+5g$ | f) $8(w-1)-3w$ | g) $6(h+2)+9$ | h) $9(p+3)+5p$ |
| i) $3(2+f)-4$ | j) $5(1+k)+4k$ | k) $5(5+p)-2z$ | l) $4(7-u)-15$ |
| m) $6(1+e)+e$ | n) $3(6+w)+w$ | o) $8(11+q)-4r$ | p) $19(7+k)-60$ |

3. Expand and simplify :

a) $6(3g + 2) + 7$

b) $2(2e + 4) - 3$

c) $7(4c + 5) - 20c$

d) $3(2t + 8) - t$

e) $3(8f + 3) - 4$

f) $3(4a + 1) - 4$

g) $2(5k + 6) + 24k$

h) $8(3h + 2) - 24h$

i) $5(2 + 2t) + 3t$

j) $4(1 + 9u) + 2u$

k) $6(4 + 10z) - 16$

l) $5(7 + 7u) - 28$

m) $9(1 + 3e) + 7e$

n) $3(2 + 6w) + 4$

o) $3(10 + 2d) + 5d$

p) $5(6 + 5x) + x$

Solving Equations

1. Solve each of the following equations :

a) $5x + 3 = 23$

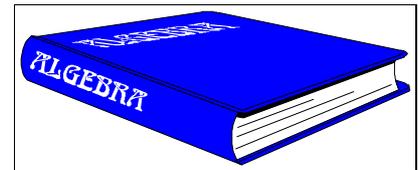
b) $7m - 11 = 24$

c) $3y + 14 = 17$

d) $10e - 6 = 14$

e) $8k - 11 = 21$

f) $12p + 1 = 37$



2. Solve :

a) $6x = 3x + 27$

b) $4a = 2a + 16$

c) $7v = v + 30$

d) $14w = 9w + 40$

e) $12x = 3x + 54$

f) $10m = 3m + 56$

3. Solve :

a) $6a + 3 = 2a + 19$

b) $7x + 5 = 5x + 17$

c) $4y - 2 = y + 19$

d) $8p - 1 = 2p + 29$

e) $11f + 4 = 3f + 52$

f) $12x - 4 = x + 51$

Test Section

Solve each of the following equations :



(1) $7x + 3 = 31$

(2) $4a - 1 = 11$

(3) $7y = 5y + 12$

(4) $8d = 5d + 33$

(5) $4x + 3 = 2x + 17$

(6) $6x - 5 = x + 40$

(7) $10p - 1 = 3p + 20$

(8) $2x + 16 = 5x - 2$

Common Factors

1. **Copy** and complete each of the following :

a) $2x + 6 = 2(x + \quad)$

b) $5a + 20 = 5(a + \quad)$

c) $4m - 24 = 4(\quad - \quad)$

d) $3f - 6 = 3(\quad - \quad)$

e) $5x + 5y = 5(\quad + \quad)$

f) $6p - 12q = 6(\quad - \quad)$

g) $3d - 12e = 3(\quad - \quad)$

h) $14 + 7k = 7(\quad + \quad)$

2. Factorise :

a) $2x + 8$

b) $3m + 12$

c) $4y - 4$

d) $5p + 5$

e) $8w - 16$

f) $7u + 21$

g) $10z - 20$

h) $6h + 24$

i) $2d - 12$

j) $5r + 5s$

k) $3k - 3l$

l) $7w + 7x$

m) $4u + 8v$

n) $6r - 18s$

o) $2e + 20f$

3. Factorise :

a) $4x + 10$

b) $6g - 15$

c) $4f + 2$

d) $8y - 4$

e) $12e + 8$

f) $6m + 21$

g) $10a - 6$

h) $9h + 12$

i) $6r - 14$

j) $4q + 18$

k) $8 + 18g$

l) $12m - 9$

Mean, Median & Mode

**** You need a calculator for this worksheet.**



1. For each set of numbers below, calculate :
 i) the **range** ;
 ii) the **average** (mean).
- (a) 22 13 12 14 12 31 11 22 16
- (b) 8 5 6 6 3 9 7 4 9 1 5 9
- (c) 18 43 76 45 87 55
- (d) $8 \cdot 3$ $2 \cdot 6$ $5 \cdot 2$ $12 \cdot 8$ $1 \cdot 7$ $17 \cdot 5$ $9 \cdot 3$
2. For each set of numbers below :
 i) arrange the numbers in order from lowest to highest;
 ii) write down the **mode** and the **median** number.
- (a) 6 8 6 7 8 5 9 1 6
- (b) 20 32 70 76 21 70 18
- (c) 9 12 13 8 4 4 12 1 6 12 7 4 12
- (d) 45 36 22 13 12 12 44 22 17 33 22
3. For each set of numbers in question 2 above, calculate the **mean** value rounding your answers to 1 decimal place where necessary.
4. Find the **median** of each set of numbers below :
- (a) 23 12 13 24 36 42 24 48

- (b) 8 22 3 25 38 24
- (c) 34 56 22 68 34 46 76 78
- (d) 2 3 2 1 3 8 6 9 14 15

5. At a golf tournament the 23 golfers taking part posted the following first round scores

72 76 69 72 70 72 70 68 84 68 76
 74 72 76 77 71 86 68 76 73 73 72 64



- (a) State the **range** of the scores.
- (b) Calculate the **mean** first round score.
- (c) Find the **median** and **mode** scores.

Frequency Tables

**** You need a calculator for this worksheet.**



Data has been collected from various sources and the following frequency tables constructed

A

Tomato Plant Heights

height (cm)	frequency
6	4
7	6
8	6
9	7
10	11
11	5



B

Family Size

Family Size	frequency
1	2
2	2
3	5
4	13
5	10
6	3
7	1



C

Number of Close Friends

No. of Friends	frequency
1	3
2	7
3	5
4	9
5	4
6	2



D

Running 400 metres

time (sec)	frequency
65	5
66	4
67	6
68	9
69	12
70	12
71	6



E

Shoe Sizes

Size	frequency
4	1
5	3
6	7
7	15
8	11
9	8
10	5
11	2
12	3



For each of the frequency tables above

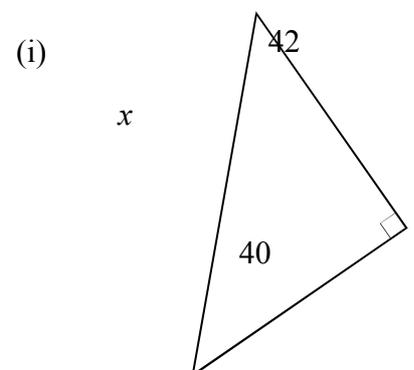
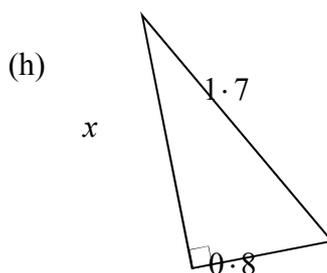
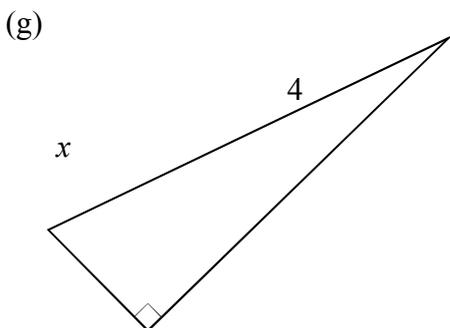
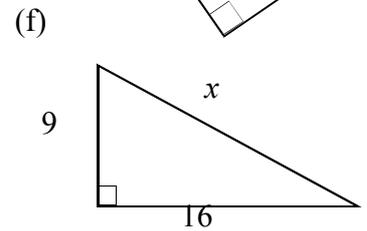
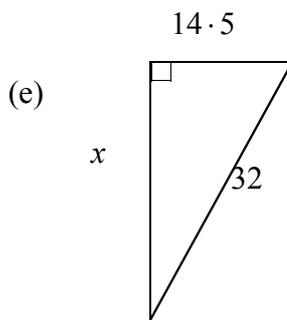
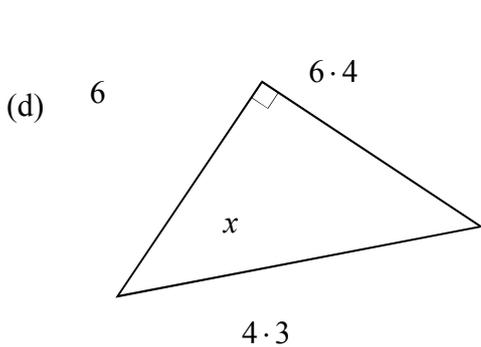
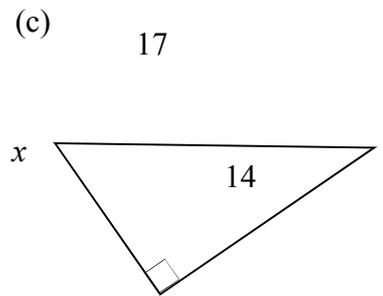
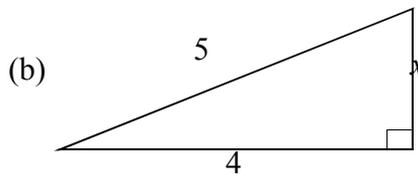
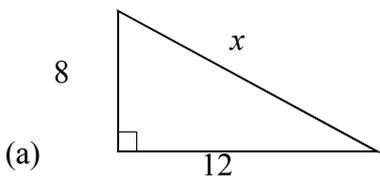
- (a) Draw a Bar Graph (or Histogram).
- (b) Calculate the **mean** value.
- (c) State the **mode** and determine the **median**.

Pythagoras' Theorem

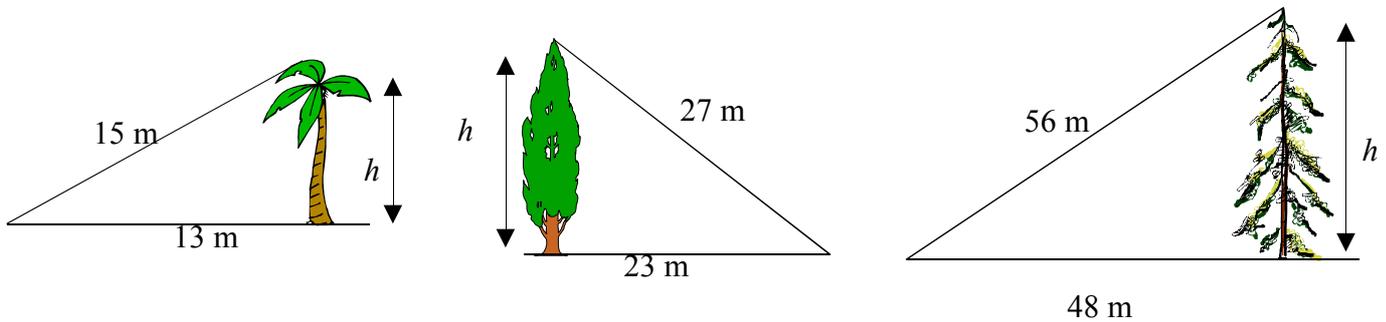
** You need a calculator for this worksheet.*



1. Calculate the length of the side marked x in each triangle below, rounding your answers to 1d.p. where necessary :



2. Calculate the height of each tree, rounding your answers to 1 – decimal place.



Distance Between Two Points

**** You need a calculator for this worksheet.**



1. Calculate the distance between each pair of points below :

Round your answers to 1-decimal place where necessary.

Plot each pair of points on a coordinate diagram and join them with a line. Construct a right angled triangle and use Pythagoras' Theorem to calculate the distance between the points.

- | | |
|-----------------------|------------------------|
| (a) P(2,1) and Q(5,3) | (b) A(1,3) and B(6,5) |
| (c) E(3,3) and F(5,8) | (d) R(1,6) and S(8,1) |
| (e) M(0,2) and N(5,5) | (f) G(7,2) and H(2,10) |
| (g) K(9,0) and L(2,7) | (h) U(1,1) and V(6,13) |
2. Calculate the distance between each pair of points below :
- Round your answers to 1-decimal place where necessary.
- | | |
|------------------------|--------------------------|
| (a) A(-3,4) and B(4,1) | (b) C(4,-6) and D(-2,-2) |
|------------------------|--------------------------|

- (c) E(3,4) and F(-2,-6)
- (d) G(-2,1) and H(7,-5)
- (e) I(0,-4) and J(-2,8)
- (f) K(-4,-3) and L(6,1)

3. (a) Triangle PQR has corner points P(1,5) , Q(3,8) and R(6,1).
 Calculate the lengths of the three sides PQ , QR and RP.
- (b) Repeat part (a) for the triangle with corners P(-3,7) , Q(-1,-4) and R(5,2).

Area and Perimeter (1)



1. Calculate the **area** and the **perimeter** of each rectangle below :

(a)

(b)

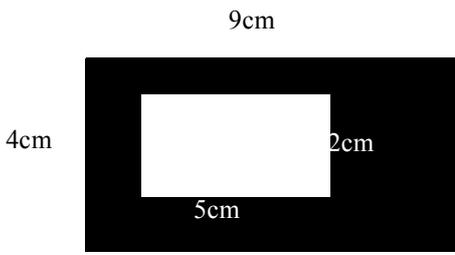
(c)

(d)

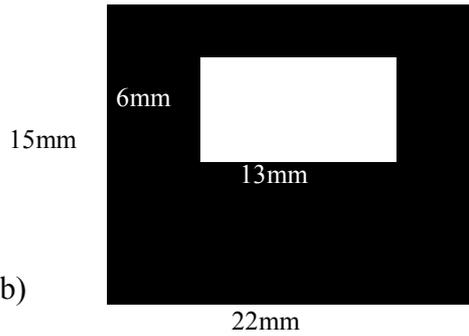
(e)

(f)

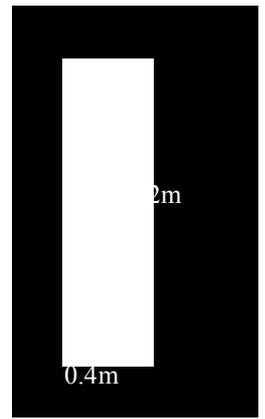
2. Calculate the shaded area in each diagram below :



(a)

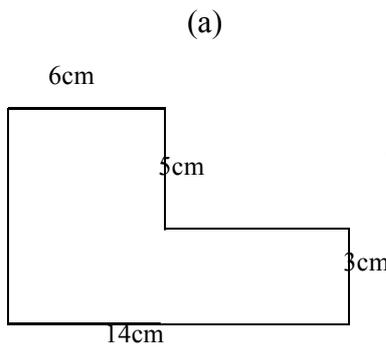


(b)

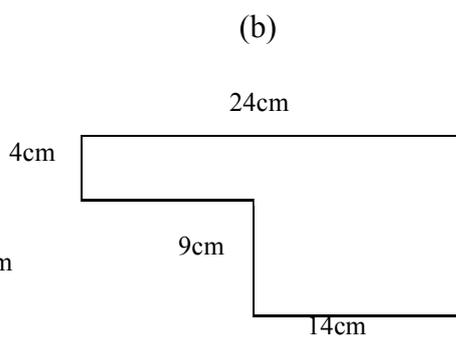


(c)

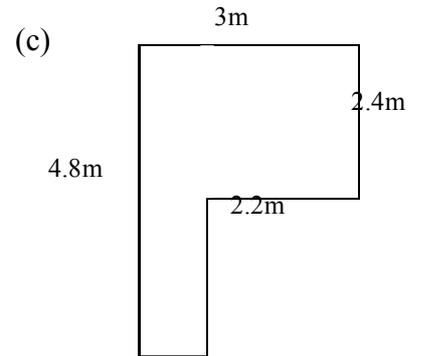
3. Calculate the area of each composite shape below :



(a)



(b)

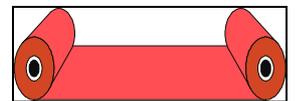


(c)

4. A carpet fitter is called out to fit a carpet in a rectangular room measuring 2.4 m by 6 m .

Calculate (a) The area of carpet needed for the room.

(b) The length of fixing strip to go round the edge of the carpet.

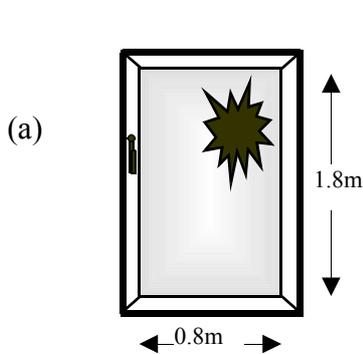


Area and Perimeter (2)

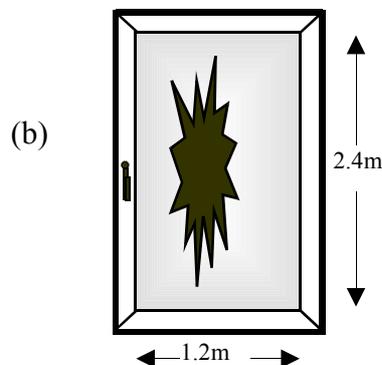
**** You need a calculator for this worksheet**



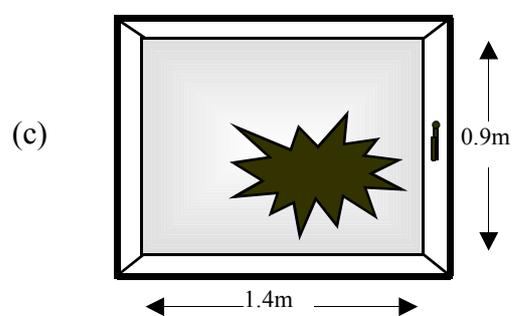
1. Calculate the cost of re-glazing each of the broken windows below, given that glass costs £13.50 per square metre to replace.



(a)

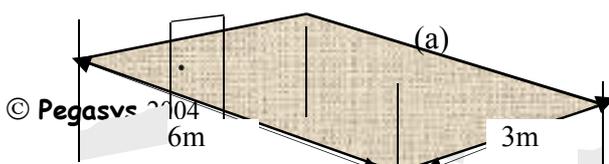


(b)

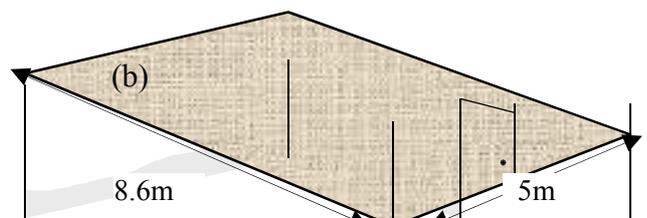


(c)

2. Carpet costs £14.80 per square metre. Calculate how much it would cost to carpet each of the rooms shown below.



(a)



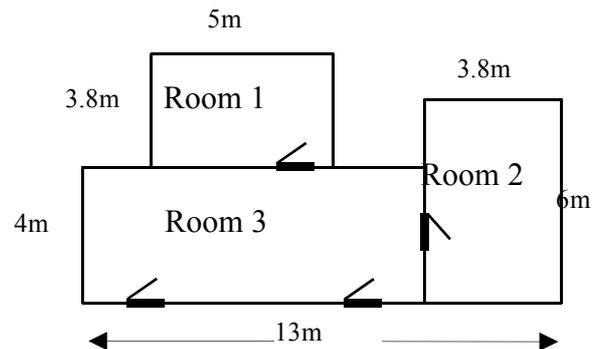
(b)

3. Fixing strip for carpets costs £1.60 per metre. Calculate the cost of the fixing strip to go round the edge of each carpet above.

4. Office carpet costs £23.50 per square metre.

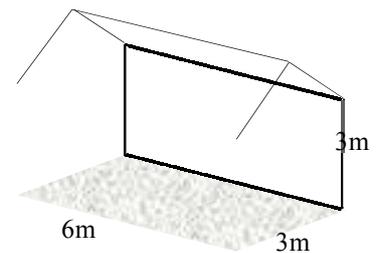
The plan of a small office complex is shown opposite.

Calculate the total cost of carpeting the three rooms.



5. A man decides to paint the four inside walls of his garage and to re-concrete the floor. The paint costs £1.20 per square metre to apply and the concrete £6.80 per square metre.

Calculate the total cost of his DIY.



Area and Perimeter (3)

**** You need a calculator for this worksheet**



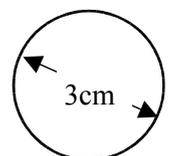
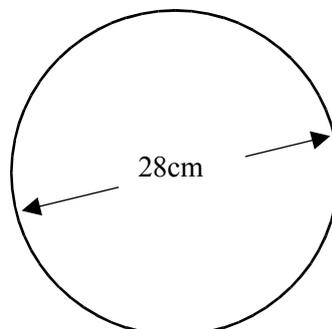
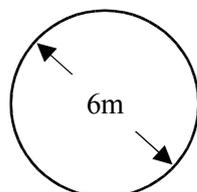
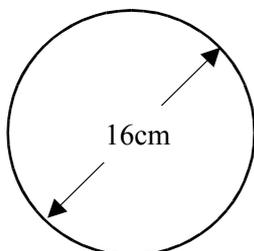
Area and Circumference of a Circle

Remember d or $2\pi r$
 $A = \pi r^2$ ($\pi = 3.14$)

1. Calculate the circumference of the circle with

- (a) diameter 10cm (b) diameter 8mm (c) diameter 1.2m (d) $d = 7\text{cm}$ (e) $d = 25\text{cm}$
 (f) radius 5cm (g) radius 11mm (h) radius 0.9m (i) $r = 12\text{cm}$ (j) $r = 1.8\text{m}$

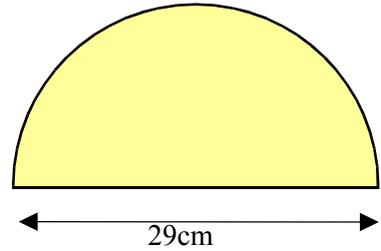
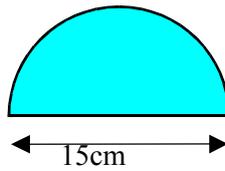
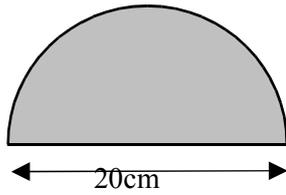
2. Calculate the circumference of each circle below.



3. Calculate the area of the circles with the following radii.
 (a) $r = 4\text{cm}$ (b) $r = 7\text{mm}$ (c) $r = 12\text{cm}$ (d) $r = 0.9\text{m}$ (e) $r = 17\text{cm}$ (f) $r = 32\text{mm}$

4. Calculate the area of each circle in question 2.

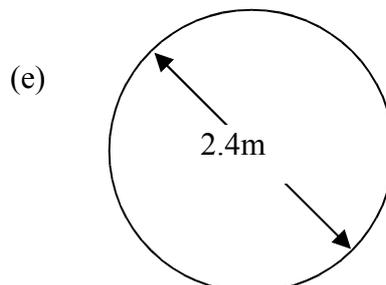
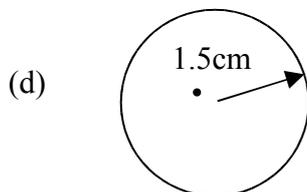
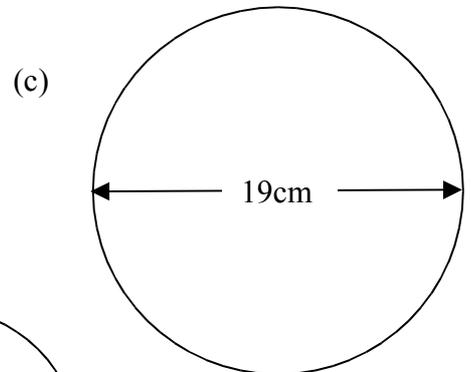
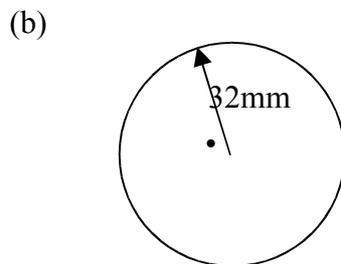
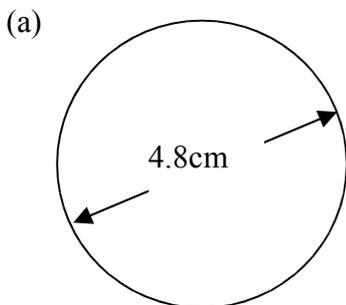
5. Calculate the area of each semi-circle below.



6. A circle has a diameter of 36cm.
 (a) Calculate the circumference of this circle (b) Calculate its area.
7. A circle has a radius of 28mm.
 (a) Calculate its area (b) Calculate its circumference.
8. Calculate the **perimeter** of each semi-circle in question 5.

Area and Perimeter (4) (More Practice)

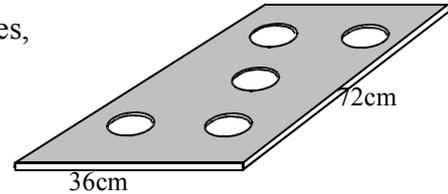
1. Calculate the **circumference** and the **area** of each circle below.



2. (a) Calculate the area of the circle with radius 42 cm.
- (b) Calculate the circumference of the circle with diameter 6.2 m.
- (c) Calculate the area of the circle with diameter 16.2 cm.
- (d) Calculate the circumference of a wheel of radius 40 cm.

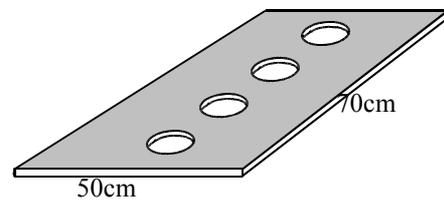
3. The diagram shows a rectangular steel plate with five holes, each with a radius of 4cm, drilled through it.

Calculate the shaded area.

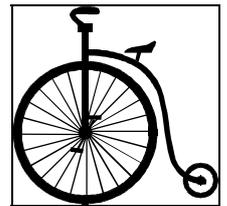


4. The diagram shows a rectangular steel plate with four holes, of radius 6cm, drilled through it.

Calculate the shaded area.



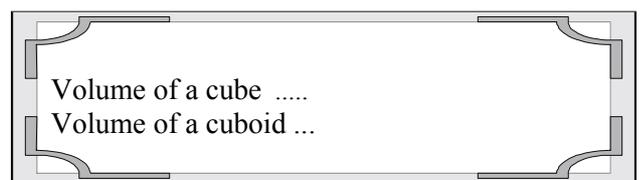
5. The "Penny-Farthing" bicycle shown opposite was all the rage when it first appeared. The large front wheel has a radius of 98cm and the small back wheel a radius of 14cm.



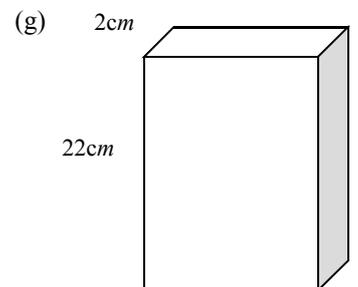
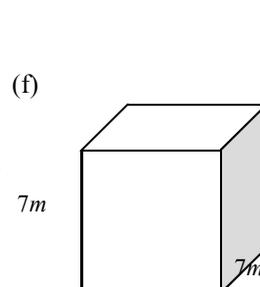
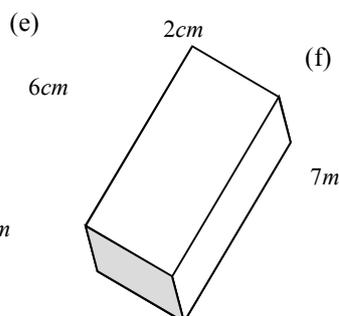
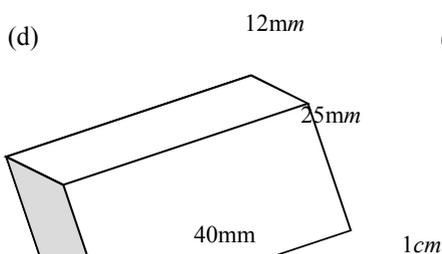
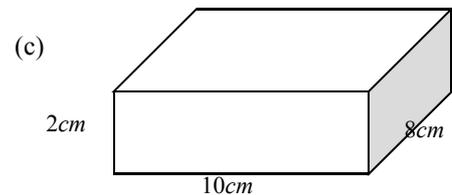
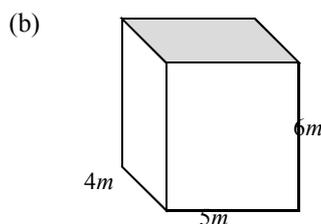
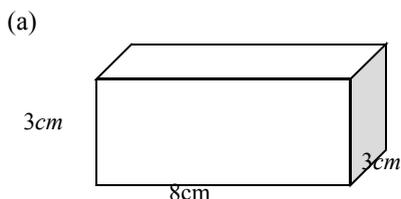
- (a) Calculate the circumference of each wheel.
- (b) How many turns will the small wheel make for one turn of the large wheel ?

Volume of a Cuboid

**** You need a calculator for this worksheet.**



1. Calculate the volume of each cuboid below :



7m

14cm

2. Calculate the volumes of the cuboids measuring :

- (a) 12cm by 8cm by 9cm
- (b) 18mm by 12mm by 3mm
- (c) 50cm by 20cm by 5cm
- (d) 15m by 7m by 8m
- (e) 11mm by 9mm by 2mm
- (f) 4.3cm by 2.2cm by 10cm



3. Calculate the volumes of the cubes of side :

- (a) 6cm
- (b) 4mm
- (c) 14cm
- (d) 23mm

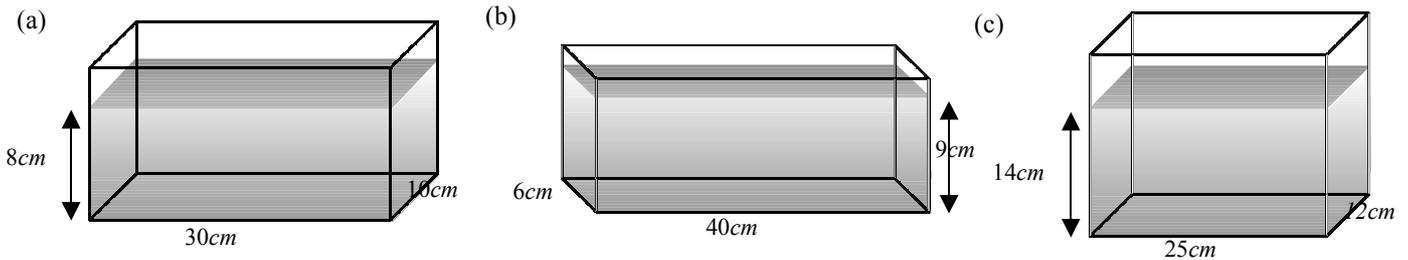


4. Convert each of the following volumes in *cubic centimetres* into *litres* :

$1 \text{ litre} = 1000 \text{ cm}^3$

- (a) 3000 cm³
- (b) 2400 cm³
- (c) 12600 cm³
- (d) 600 cm³
- (e) 1460 cm³
- (f) 480 cm³
- (g) 320000 cm³
- (h) 2565 cm³

5. Calculate the volume of water in each fish tank below, giving your answer in *litres* :

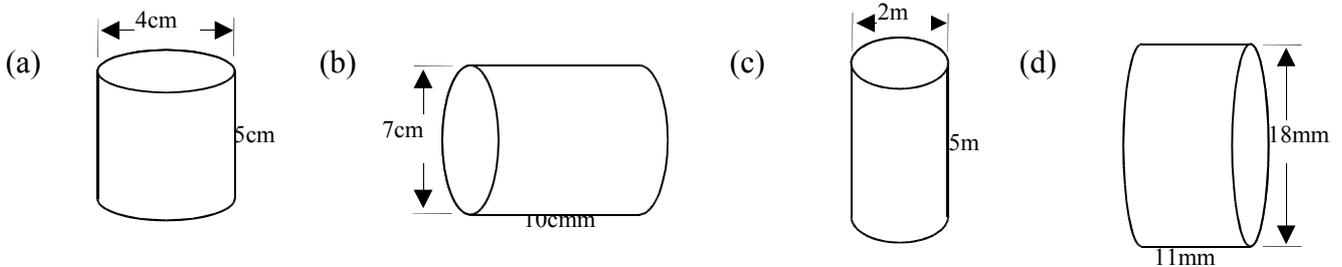


Volume of a Cylinder

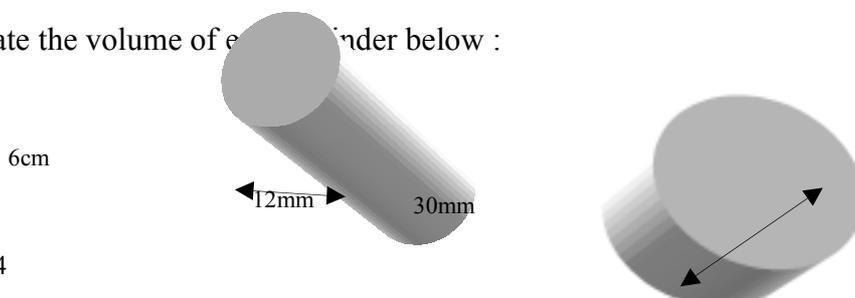
**** You need a calculator for this worksheet**



1. Calculate the volume of each cylinder below :



2. Calculate the volume of each cylinder below :

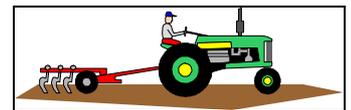


<p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p>	
<p>(c)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"> <p style="text-align: center;">Taxable Income £23000</p> <p>Tax ⇒ £3000 at 20% =</p> <p style="padding-left: 40px;">£20000 at 25% =</p> <p style="text-align: right;">Total Tax =</p> </td> </tr> </table>	<p style="text-align: center;">Taxable Income £23000</p> <p>Tax ⇒ £3000 at 20% =</p> <p style="padding-left: 40px;">£20000 at 25% =</p> <p style="text-align: right;">Total Tax =</p>	<p>(d)</p> <p>_____</p> <p>_____</p>
<p style="text-align: center;">Taxable Income £23000</p> <p>Tax ⇒ £3000 at 20% =</p> <p style="padding-left: 40px;">£20000 at 25% =</p> <p style="text-align: right;">Total Tax =</p>		

3. John Henderson is a married man with a gross income of £25600 p.a. . He claims the personal and married allowances and has a further £800 in mortgage allowance. Calculate :

- (a) his total allowances. (b) his taxable income. (c) the income tax he pays.

4. Ian McStay is a farmer with an income of £26000. He is married and claims the married allowance + additional allowances totalling £4500. Calculate :



- (a) his total allowances. (b) his taxable income. (c) the income tax he has to pay.

5. Susan Moffat is a computer analyst with an income of £43000. She is single and claims allowances of £3000 over and above her personal allowance. Calculate :



- (a) her total allowances. (b) her taxable income. (c) the income tax she pays.

Holiday Travel

Use the currency table opposite to answer the questions on this worksheet unless instructed otherwise.

1. Change each of the sums of money into the currency indicated :

- | | |
|-------------------------|---------------------|
| (a) £240 (francs) | (b) £550 (escudos) |
| (c) £60 (lire) | (d) £80 (pesetas) |
| (e) £1200 (dollars) | (f) £100 (marks) |
| (g) £28 (francs) | (h) £285 (drachmas) |
| (i) £990 (swiss francs) | (j) £2400 (marks) |

Exchange Rate	
<i>equivalent to £1</i>	
9.65	francs
1.55	dollars
2700	lire
280	escudos
340	drachmas
205	pesetas
2.20	Swiss fr.
2.45	marks

2. Change each of these sums of money into pounds sterling :

- | | |
|---------------------|--------------------|
| (a) 579 francs | (b) 12040 escudos |
| (c) 13500 lire | (d) 79950 pesetas |
| (e) 651 dollars | (f) 490 marks |
| (g) 1200 francs | (h) 16800 drachmas |
| (i) 84 swiss francs | (j) 56 marks |



3. Mr and Mrs Wilson are taking their caravan to France.
- (a) They changed their £1400 spending money into francs. How many francs did they get?
- (b) When they returned home they had 1737 francs left. How much did they receive in pounds sterling for their francs?

4. John and Graeme are off on a camping holiday to Italy. John has £750 spending money and Graeme has £680.



- (a) They changed their spending money into lire. How many lire did each receive?
- (b) John returned home with 56700 lire and Graeme with 22950 lire. How much did each boy **spend** in pounds?

5. A salesman travelling from Spain to Switzerland notices the same motorbike for sale, first in Spain, and then in Switzerland.
In Spain it is priced at 194 750 pesetas and in Switzerland 2156 francs.
In which country is the motorbike the cheapest and by how much?



6. In anticipation of going ashore, a tourist on board a ferry changed £65 into francs at the rate of 9.80 francs to the pound. She did not spend any money. When she returned to the ferry she changed her money back at the rate of 9.98 francs to the pound.
How much did she lose on the deal?



7. In France petrol costs 7.2 francs per litre.
- (a) How much is this in British money if the exchange rate is 9.6 francs to the pound.
- (b) How much is this a gallon, in British money, if 1litre = $\frac{7}{32}$ of a gallon ?

Formulae & Sequences

All working must be shown. Formulae should be written out and substitutions made !

1. A formula is given as $F = 5a + 4$.
- (a) Find the value of F when i) $a = 3$ ii) $a = 7$ iii) $a = \frac{1}{2}$.
- (b) What value of a would make F equal to 54 ?
2. A formula is defined as $E = 3f + g$.
- Find the value of E when ...
- | | |
|----------------------------|--|
| (a) $f = 4$ and $g = 6$. | (b) $f = 6$ and $g = 1$. |
| (c) $f = 2$ and $g = 5$. | (d) $f = \frac{1}{3}$ and $g = 4$. |
| (e) $f = 12$ and $g = 7$. | (f) $f = \frac{1}{2}$ and $g = 2\frac{1}{2}$. |

3. A formula is defined as $P = rs - 2k$.
- (a) Find P when $r=3$, $s=6$ and $k=4$. (b) Find P when $r=2$, $s=4$ and $k=3$.
- (c) Find P when $r=8$, $s=2$ and $k=5$. (d) Find P when $r=3$, $s=8$ and $k=12$.
4. The first formula of motion can be defined as follows $a = \frac{v - u}{t}$,
 where a is the acceleration, v is the final velocity, u is the initial velocity and t is the time.
- (a) Find a when $v=20$, $u=12$ and $t=2$. (b) Find a when $v=400$, $u=8$ and $t=16$.
5. The second formula of motion takes the form $s = ut + \frac{1}{2}at^2$, where s is the distance moved.
- (a) Find s when $u=3$, $t=4$ and $a=2$. (b) Find s when $u=2$, $t=7$ and $a=6$.
6. Find a formula connecting the variables in each table below :
- (a)

a	1	2	3	4	5
F	4	7	10	13	16

 (b)

g	1	2	3	4	5
P	3	8	13	18	23
- (c)

x	5	6	7	8	9
E	13	15	17	19	21

 (d)

h	3	4	5	6	7
Q	19	27	35	43	51
7. Find a formula for the n^{th} term of each of the following sequences and hence find the 20th term of each sequence.
- (a) 3, 7, 11, 15, (b) 14, 26, 38, 50, (c) 2, 8, 14, 20,

Probability – Multiple Outcomes (Tree Diagrams)

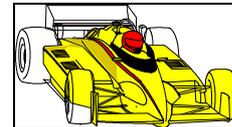
1. A coin is tossed twice.
- (a) Draw a tree diagram to show all the possible outcomes.
- (b) How many possible outcomes are there?
- (c) Calculate i) P(two tails) ii) P(1 head and 1 tail).
2. A coin is tossed three times.
- (a) Draw a tree diagram to show all the possible outcomes.
- (b) How many possible outcomes are there?
- (c) Calculate i) P(three heads) ii) P(two heads and one tail).

3. A three-sided spinner is coloured Green, Red and Yellow.
- If it is spun **twice**, draw a tree diagram to show all the possible outcomes.
 - How many possible outcomes are there?
 - Calculate i) $P(\text{two greens})$ ii) $P(\text{two colours the same})$ iii) $P(\text{two different colours})$.
4. A three-sided spinner is coloured Green, Red and Yellow.
- If it is spun **three times**
- How many possible outcomes are there?
 - Calculate i) $P(\text{three greens})$ ii) $P(\text{three colours the same})$.
5. Four young boys take part in a lucky dip. They will win one of the two toy cars shown below. They have an equal chance of winning either one.

Jeep



Racing car



- Draw a tree diagram to show all the possible outcomes. How many possible outcomes are there?
- What is the probability that all the boys win the racing car?
- What is the probability that two win the racing car and two win the jeep?
- Calculate the probability that one wins the jeep and the other three win the racing car.

Answers to S3 General Revision Pack

Rounding (answers)

- | | | | | |
|----|----------|---------|---------|----------|
| 1. | a) 30 | b) 860 | c) 490 | d) 80 |
| | e) 560 | f) 1240 | g) 570 | h) 800 |
| 2. | a) 57 | b) 9 | c) 6 | d) 15 |
| | e) 29 | f) 342 | g) 123 | h) 9 |
| 3. | a) 26.3 | b) 8.5 | c) 34.7 | d) 2.6 |
| | e) 14.8 | f) 23.9 | g) 39.6 | h) 7.7 |
| | i) 29.3 | j) 1.6 | k) 68.7 | l) 4.3 |
| | m) 124.0 | n) 18.9 | o) 4.5 | p) 13.0 |
| 4. | a) 36.34 | b) 8.12 | c) 3.79 | d) 22.16 |

- | | | | |
|----------|---------|----------|----------|
| e) 4.72 | f) 7.86 | g) 14.66 | h) 17.38 |
| i) 6.24 | j) 6.56 | k) 1.786 | l) 9.27 |
| m) 13.70 | n) 8.99 | o) 17.60 | p) 2.91 |

Calculations & Rounding (answers)

- | | | | | | | |
|----|----------|-----------|-----------|-----------|---------|---------|
| 1. | a) 14.8 | b) 2.6 | c) 1.7 | d) 22.1 | e) 27.4 | f) 44.6 |
| 2. | a) 31.79 | b) 16.81 | c) 181.43 | d) 65.93 | e) 7.67 | f) 9.63 |
| 3. | a) 0.43 | b) 0.58 | c) 0.56 | d) 0.08 | | |
| 4. | a) £4 | b) £26 | c) £4 | d) £13 | | |
| 5. | a) £4.25 | b) £25.89 | c) £4.09 | d) £12.85 | | |
| 6. | a) £4.42 | b) 6p | | | | |

Squares & Square Roots (answers)

- | | | | | | | |
|----|----------|-----------|-----------|-----------|---------|---------|
| 1. | a) 2.83 | b) 4.80 | c) 10.95 | d) 3.61 | e) 1.73 | f) 6.71 |
| | g) 15.33 | h) 35.07 | i) 2.93 | j) 5.44 | k) 0.84 | l) 6.26 |
| 2. | a) 4.123 | b) 16.971 | c) 58.975 | d) 4.858 | | |
| | e) 9.220 | f) 18.466 | g) 5.568 | h) 25.962 | | |
| 3. | a) 5 | b) 26 | c) 7.28 | d) 12.65 | e) 25 | |
| | f) 16.64 | g) 4.58 | h) 9.64 | i) 2.92 | j) 5.52 | |
| | k) 1.36 | l) 1.10 | m) 2.68 | n) 11.74 | | |

Standard Form (answers)

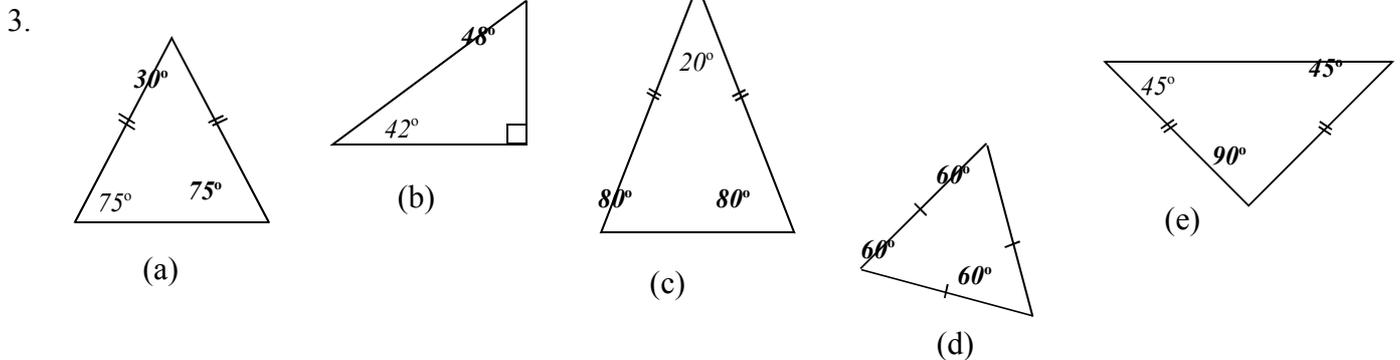
- | | | | | | | |
|----|-------------------------|--------------------------|--------------------------|---------------|--------------|------------|
| 1. | a) 2.34×10^5 | b) 6.5×10^2 | c) 8.7×10^3 | | | |
| | d) 1.2×10^{10} | e) 4.3×10^1 | f) 9.21×10^0 | | | |
| 2. | a) 240 | b) 36.1 | c) 70030 | d) 58000000 | e) 6040 | f) 2 |
| 3. | a) 4.5×10^{-3} | b) 3.04×10^{-2} | c) 5.0×10^{-8} | | | |
| | d) 8.6×10^{-1} | e) 8.9×10^{-10} | f) 3.45×10^{-4} | | | |
| 4. | a) 0.0087 | b) 0.392 | c) 0.00000207 | d) 0.078 | e) 0.0006005 | f) 0.00005 |
| 5. | a) 9.3×10^7 | b) 1.12×10^5 | c) 3700 000 000 | d) 0.00000019 | | |

Angles And Triangles (answers)

All answers in degrees

1. $a = 115$ $b = 60$ $c = 145$ $d = 90$ $e = 100$ $f = 75$
 $g = 112$ $h = 142$ $i = 142$ $j = 85$ $k = 95$ $l = 85$
 $m = 32$ $n = 32$ $p = 148$

2. $a = 40$ $b = 108$ $c = 80$ $d = 90$



Shapes And Coordinates (answers)

1. a) diagram b) D(2,7) 2. a) diagram b) S(1,6)
 3. a) diagram b) H(8,8) 4. a) diagram b) W(3,5)
 5. a) diagram b) D(2,-2) 6. a) diagram b) D(3,1)
 7. a) diagram , D(-4,3) b) diagram , D(-2,3) c) diagram , D(5,-1)
 8. a) diagram b) S(1,2)

Working With Percentages (answers)

1. a) £0.32 b) £0.87 c) £0.20 d) £0.08 e) £0.03
 f) £0.90 g) £0.07 h) £0.125 i) £0.035
2. a) £8.64 b) £1680 c) £61.20 d) £1.20 e) £1.64 f) £10 320
 g) £6.90 h) £6.96 i) £1.70 j) £1.44 k) £13 l) £15
3. a) £10.35 b) £4.00 c) £5.74 d) £1.21 e) £0.73 f) £0.74
 g) £0.68 h) £0.90 i) £54.42 j) £0.50 k) £10.87 l) £1.27
 m) 17p n) 11p o) 1p p) 71p
4. Radio - £31.50 Skate Board - £21.60 Yo-Yo - £10.80
 Video - £415.80 CD Player - £111.33 Shades - £14.85
5. £37.80 £25.92 £12.96
 £498.96 £133.60 £17.82

Wages & Salaries (answers)

1. a) i) £139.20 ii) £7238 b) i) £178.50 ii) £9282
 c) i) £345.40 ii) £17961 d) i) £119 ii) £6188
2. a) i) £296.15 ii) £7.79 b) i) £356.92 ii) £11.90
 c) i) £515.38 ii) £12.27 d) i) £544.23 ii) £11.83
3. a) £237.65 b) £128 c) £445.20 d) £301.63
4. £267.30
5. £161.00

Overtime & Commision (answers)

1. a) £248.40 b) £291.20 c) wk1 ... £368.55 wk2 ... £356.40
2. £201.40
3. a) £23 b) £36 c) £62.50
4. £266
5. £415.10

Savings & Interest (answers)

1. a) £24 b) £56 c) £19.20 d) £3.22
2. a) i) £45 ii) £70.20 iii) £16 iv) £244.80 b) £48
3. a) £33.60 b) £22.60 c) £2.20 d) £65.61 e) £5.75 f) £8.40
4. £80
5. £80

V.A.T. (answers)

1. a) £14 b) £ 22.75 c) £1.40 d) £14.35 e) £11.90 f) £112
2. camera a) £10.50 glasses a) £4.55 ring a) £40.25 CD a) £2.10
 b) £70.50 b) £30.55 b) £2170.25 b) £14.10

- skates a) £8.40
b) £56.40
- cycle a) £31.50
£211.50
- stereo a) £25.90
£173.90
3. a) 4.80
23.00
68.00
95.80
16.77
£112.57
- b) 19.20
48.60
28.80
96.60
16.91
£113.51
4. 19270 , 19280 the first one by £10.

Electricity Bills (answers)

1. A 300 2. A 1335 3. A 644 4. A 750 5. A 97
B £24.33 B £84.24 B £54.61 B £48.53 B £9.04
C £32.73 C £94.64 C £63.33 C £60.93 C £17.67
D £5.73 D £16.56 D £11.08 D £10.66 D £3.09
E **£38.46** E **£111.20** E **£74.41** E **£71.59** E **£20.76**

Hire Purchase (answers)

1. Computer i) £890 Car i) £10820 Motorbike i) £826 Printer i) £390
ii) £110 ii) £1820 ii) £66 ii) £40
- Camera i) £742 Caravan i) £7173 Earrings i) £225.90
ii) £67 ii) £723 ii) £35.90
2. a) £381.60 b) £41.60

Scale Drawings (answers)

1. Rectangle i) $k = 2$ Oval i) $k = 2$ Heart i) $k = 2$ Star i) $k = 2$
ii) 16cm ii) 36mm ii) 7.5mm ii) 42cm
- Triangle i) $k = 2$ Cylinder i) $k = 2$
ii) 32cm ii) 18cm
2. Rectangle i) $k = 0.5$ Trapezium i) $k = 0.25$ Star i) $k = 0.8$ Arrow i) $k = 0.75$
ii) 9cm ii) 15mm ii) 21.6mm ii) 21mm

Calculation of Distance (answers)

1. a) 200km b) 390 miles c) 217.5km d) 12km e) 24miles

2. a) 3220km b) Yes (max. distance 5980km)
3. a) 91km b) $28 + 126 + 21 = 175\text{km}$

Working with Time & Speed (answers)

1. a) 4.47 hrs b) 5.8 hrs c) 0.67 hrs d) 2.1 hrs e) 1.3 hrs f) 0.62 hrs
 g) 12.72 hrs h) 7.85 hrs i) 2.35 hrs j) 22.13 hrs k) 9.92 hrs l) 17.7 hrs
2. a) 73.9 km/h b) 392 km/h c) 72.5 mph
 d) 9.5 km/h e) 11.4 km/h f) 10.0 km/h
3. a) 66.2 km/h b) 49.8 mph c) i) 3h 15min ii) 40 mph

Calculation of Time (answers)

1. a) 2h 24min b) 3h 36min c) 1h 21min d) 8h 20min e) 9h 13min f) 4h 45min
 g) 12h 30min h) 3h 11min i) 6h 7min j) 18h 27min k) 2h 19min l) 5h 39min
2. a) 5h 19min b) 11h 14min c) 1h 13min d) 10h 20min e) 1h 36min f) 13h 46min
3. a) 6h 18min b) 49 mins c) 1h 18min d) 1133

Removing Brackets (answers)

1. a) $4c + 8$ b) $2e + 8$ c) $5f + 30$ d) $3t + 24$
 e) $7g + 21$ f) $9w + 9$ g) $6h + 36$ h) $8p + 16$
 i) $6 + 3y$ j) $7 + 7k$ k) $25 + 5z$ l) $28 + 4u$
 m) $9 + 9e$ n) $6 + 3w$ o) $96 + 8r$ p) $70 + 10m$
2. a) $15c + 10$ b) $4e + 8$ c) $24f + 36$ d) $6t + 24$
 e) $16g + 6$ f) $24w + 6$ g) $35h + 42$ h) $24p + 16$
 i) $6 + 6y$ j) $7 + 63k$ k) $25 + 50z$ l) $28 + 28u$
 m) $9 + 27e$ n) $6 + 18w$ o) $36 + 6r$ p) $28 + 20m$
- 3.

a) $c^2 + 5c$	b) $e^2 + 2e$	c) $f^2 + 4f$	d) $t^2 + 7t$
e) $eg + 3e$	f) $pw + p$	g) $ah + 6a$	h) $rp + 2r$
i) $2y + y^2$	j) $c + ck$	k) $5z + z^2$	l) $7h + hu$
m) $e + e^2$	n) $2p + pw$	o) $12x + x^2$	p) $7m + m^2$

4.

a) $3c - 6$	b) $5e - 20$	c) $5f + 20$	d) $2t - 14$
e) $g^2 - 3g$	f) $vw + v$	g) $h^2 - 6h$	h) $4p - p^2$
i) $6 - 3y$	j) $p - pk$	k) $ab + ac$	l) $x^2 - xy$

Simplifying Expressions (answers)

1.

a) $5x$	b) $12p$	c) $8a - 3$	d) $6m$	e) $4v$	f) $9y$	g) $8a + 4b$	h) $5f + 6$
i) $10x + 3$	j) $4c + 9$	k) $9m + 3$	l) $6y + 5$	m) $4 + 3x$	n) $4d + 6$	o) $6y + 6z$	
p) $4a + 5b$	q) $5 + 7x$	r) $9g + 6h$	s) $5r + 6$	t) $9x + 3$	u) $9y - 4$		

2.

a) $3c + 13$	b) $2e + 3$	c) $8f - 36$	d) $4t + 25$
e) $12g - 21$	f) $5w - 8$	g) $6h + 21$	h) $14p + 27$
i) $2 + 3f$	j) $5 + 9k$	k) $25 + 3p$	l) $13 - 4u$
m) $6 + 7e$	n) $18 + 4w$	o) $88 + 4r$	p) $73 + 19k$

3.

a) $18g + 19$	b) $4e + 5$	c) $8c + 35$	d) $5t + 24$
e) $24f + 5$	f) $12a - 1$	g) $34k + 12$	h) 16
i) $10 + 13t$	j) $4 + 38u$	k) $8 + 60z$	l) $7 + 35u$
m) $9 + 34e$	n) $10 + 18w$	o) $30 + 11d$	p) $30 + 26x$

Solving Equations (answers)

1.

a) $x = 4$	b) $m = 5$	c) $y = 1$
d) $e = 2$	e) $k = 4$	f) $p = 3$

2.

a) $x = 9$	b) $a = 8$	c) $v = 5$
d) $w = 8$	e) $x = 6$	f) $m = 8$

3.

a) $a = 4$	b) $x = 6$	c) $y = 7$
d) $p = 5$	e) $f = 6$	f) $x = 5$

Test Section	1) $x = 4$	2) $a = 3$	3) $y = 6$	4) $d = 11$
	5) $x = 7$	6) $x = 9$	7) $p = 3$	8) $x = 6$

Common Factors (answers)

1. a) $2(x+3)$ b) $5(a+4)$ c) $4(m-6)$ d) $3(f-2)$
 e) $5(x+y)$ f) $6(p-2q)$ g) $3(d-4e)$ h) $7(2+k)$
2. a) $2(x+4)$ b) $3(m+4)$ c) $4(y-1)$ d) $5(p+1)$
 e) $8(w-2)$ f) $7(u+3)$ g) $10(z-2)$ h) $6(h+4)$
 i) $2(d-6)$ j) $5(r+s)$ k) $3(k-l)$ l) $7(w+x)$
 m) $4(u+2v)$ n) $6(r-3s)$ o) $2(e+10f)$
3. a) $2(2x+5)$ b) $3(2g-5)$ c) $2(2f+1)$ d) $4(2y-1)$
 e) $4(3e+2)$ f) $3(2m+7)$ g) $2(5a-3)$ h) $3(3h+4)$
 i) $2(3r-7)$ j) $2(2q+9)$ k) $2(4+9g)$ l) $3(4m-3)$

Mean, Median & Mode (answers)

1. a) i) range = 20 ii) mean = 17 b) i) range = 8 ii) mean = 6 c) i) range = 69 ii) mean = 54 d) i) range = 15.8 ii) mean = 8.2
2. a) i) 1,5,6,6,6,7,8,8,9 ii) mode = 6, median = 6
 b) i) 18,20,21,32,70,70,76 ii) mode = 70, median = 32
 c) i) 1,4,4,4,6,7,8,9,12,12,12,12,13 ii) mode = 12, median = 8
 d) i) 12,12,13,17,22,22,22,33,36,44,45 ii) mode = 22, median = 22
3. a) mean = 6.2 b) mean = 43.9 c) mean = 8 d) mean = 23.1
4. a) 24 b) 23 c) 51 d) 4.5
5. a) range = 22 b) mean = 73 c) median = 72, mode = 72

Frequency Tables (answers)

- A a) diagram b) mean = 8.8 c) mode = 10cm, median = 9cm
- B a) diagram b) mean = 4.1 c) mode = 4, median = 4
- C a) diagram b) mean = 3.3 c) mode = 4, median = 3.5
- D a) diagram b) mean = 68.5 c) mode = 69,70, median = 69
- E a) diagram b) mean = 7.7 c) mode = 7, median = 8

Pythagoras' Theorem (answers)

1. a) 14.4 b) 3 c) 9.6 d) 8.8 e) 28.5
 f) 18.4 g) 1.6 h) 1.5 i) 58
2. $h = 7.5\text{m}$, $h = 14.1\text{m}$, $h = 28.8\text{m}$

Distance Between Two Points (answers)

1. a) 3.6 b) 5.4 c) 5.4 d) 8.6
 e) 5.8 f) 9.4 g) 9.9 h) 13
2. a) 7.6 b) 7.2 c) 11.2 d) 10.8 e) 12.2 f) 10.8
3. a) $PQ = 3.6$, $QR = 7.6$, $RP = 6.4$
 b) $PQ = 11.2$, $QR = 8.5$, $RP = 9.4$

Area and Perimeter (1) (answers)

1. a) $A = 40\text{ cm}^2$, $P = 26\text{ cm}$ b) $A = 63\text{ cm}^2$, $P = 32\text{ cm}$
 c) $A = 10\text{ m}^2$, $P = 14\text{ m}$ d) $A = 84\text{ mm}^2$, $P = 40\text{ mm}$
 e) $A = 9\text{ m}^2$, $P = 13.6\text{ m}$ f) $A = 12.16\text{ cm}^2$, $P = 14\text{ cm}$
2. a) $A = 26\text{ cm}^2$ b) $A = 252\text{ mm}^2$ c) $A = 1.12\text{ m}^2$
3. a) $A = 14.4\text{ m}^2$ b) 16.8 m

Area and Perimeter (2) (answers)

1. a) £19.44 b) £38.88 c) £17.01
2. a) £266.40 b) £43.00
3. a) £28.80 b) £43.52
4. (Total Area = $19 + 22.8 + 36.8 = 78.6\text{ sq. m}$) cost = £1847.10
5. Total cost = £64.80 (paint) + £122.40 (concrete) = £187.20

Area and Perimeter (3) (answers)

1. a) 31.4 cm b) 25.1 mm c) 3.8 m d) 22.0 cm e) 78.5 cm

- f) 31.4 cm g) 69.1 mm h) 5.7 m i) 75.4 cm j) 11.3 m
2. 50.2 cm , 18.8 m , 87.9 cm , 9.4 cm
3. a) 50.2cm^2 b) 153.9mm^2 c) 452.2cm^2
d) 2.5m^2 e) 907.5cm^2 f) 3215.4mm^2
4. 201.0cm^2 , 28.3m^2 , 615.4cm^2 , 7.1cm^2
5. 157cm^2 , 88.3cm^2 , 330.1cm^2
6. a) 113.0 cm b) 1023.8cm^2
7. a) 2461.8mm^2 b) 175.8 mm
8. 51.4 cm , 38.6 cm , 74.5 cm

Area and Perimeter (4) (answers)

1. a) $C = 15.1\text{cm}$, $A = 18.1\text{cm}^2$ b) $C = 201.0\text{mm}$, $A = 3215.4\text{mm}^2$
c) $C = 59.7\text{cm}$, $A = 283.4\text{cm}^2$ d) $C = 9.4\text{cm}$, $A = 7.1\text{cm}^2$
e) $C = 7.5\text{m}$, $a = 4.5\text{m}^2$
2. a) 5539.0cm^2 b) 19.5 m c) 206.0cm^2 d) 251.2 cm
3. Area = 2340.8cm^2
4. Area = 3047.8cm^2
5. a) front = 615.4 cm , back = 87.9 cm b) 7 turns

Volume of a Cuboid (answers)

1. a) 72cm^3 b) 120m^3 c) 160cm^3 d) 12000mm^3
e) 12cm^3 f) 343m^3 g) 616cm^3
2. a) 864cm^3 b) 648mm^3 c) 5000cm^3
d) 840m^3 e) 198mm^3 f) 94.6cm^3
3. a) 216cm^3 b) 64mm^3 c) 2744cm^3 d) 12167mm^3
4. a) 3 litres b) 2.4 litres c) 12.6 litres d) 0.6 litre
e) 1.46 litres f) 0.48 litre g) 320 litres h) 2.565 litres
5. a) 2.4 litres b) 2.16 litres c) 4.2 litres

Volume of a Cylinder (answers)

1. a) 62.8 cm^3 b) 384.7 cm^3 c) 15.7 m^3 d) 2797.7 mm^3
2. 117.8 cm^3 , 3391.2 mm^3 , 769.3 cm^3 , 17.8 m^3
3. 330 ml
4. 2000 ml (2 litres)
5. 753.6 cm^3
6. 360 litres

Income Tax (answers)

1.

Q.	Income	Allowances	Taxable Income
(a)	£18000	£3500	£14500
(b)	£26000	£5500	£20500
(c)	£21500	£5000	£16500

2.

$$\begin{array}{r}
 = 600.00 \\
 = \underline{3250.00} \\
 \text{Total} = \underline{\underline{£3850.00}}
 \end{array}$$

(a)

$$\begin{array}{r}
 = 600.00 \\
 = \underline{1250.00} \\
 \text{Total} = \underline{\underline{£1850.00}}
 \end{array}$$

(b)

$$\begin{array}{r}
 = 600.00 \\
 = \underline{5000.00} \\
 \text{Total} = \underline{\underline{£5600.00}}
 \end{array}$$

(c)

$$\begin{array}{r}
 = 600.00 \\
 = 5250.00 \\
 = 3200.00 \\
 \hline
 \text{Total} = \underline{\underline{£9050.00}}
 \end{array}$$

(d)

3. a) £5800 b) £19800 c) £4800
4. a) £9500 b) £16500 c) £3975
5. a) £6500 b) £36500 c) £10850

Holiday Travel (answers)

1. a) 2316 francs b) 154000 escudos c) 162000 lire d) 16400 pesetas e) 1860 dollars
f) 245 marks g) 270.20 francs h) 96900 drachmas i) 2178 Sw. fr j) 5880 marks
2. a) £60 b) £43 c) £5 d) £390 e) £420 f) £200 g) £124.35 h) £49.41
i) £38.18 j) £22.86
3. a) 13510 b) £180
4. a) 2 025 000 , 1 836 000 b) John - £729 , Graeme - £671.50
5. Spain is the cheapest by £30
6. She lost £1.17
7. a) 75p b) £3.43

Formulae & Sequences (answers)

1. a) i) $F = 19$ ii) $F = 39$ iii) $F = 6.5$
b) $a = 10$
2. a) $E = 18$ b) $E = 19$ c) $E = 11$
d) $E = 5$ e) $E = 43$ f) $E = 4$
3. a) $P = 10$ b) $P = 2$ c) $P = 6$ d) $P = 0$
4. a) $a = 4$ b) $a = 24.5$
5. a) $s = 28$ b) $s = 161$
6. a) $F = 3a + 1$ b) $P = 5g - 2$
c) $E = 2x + 3$ d) $Q = 8h - 5$
7. a) $U_n = 4n - 1$, $U_{20} = 79$ b) $U_n = 12n + 2$, $U_{20} = 242$
c) $U_n = 6n - 4$, $U_{20} = 116$

Probability (answers)

1. a) diagram b) 4 possible outcomes c) i) $P(2T) = \frac{1}{4}$ ii) $P(1H/1T) = \frac{2}{4} = \frac{1}{2}$
2. a) diagram b) 8 possible outcomes c) i) $P(3H) = \frac{1}{8}$ ii) $P(2H/1T) = \frac{3}{8}$
3. a) diagram b) 9 possible outcomes c) i) $P(2G) = \frac{1}{9}$ ii) $P = \frac{3}{9} = \frac{1}{3}$ iii) $P = \frac{6}{9} = \frac{2}{3}$
4. a) 27 possible outcomes b) i) $P(3G) = \frac{1}{27}$ ii) $P = \frac{3}{27} = \frac{1}{9}$
5. a) diagram , 16 outcomes b) $P = \frac{1}{16}$ c) $P = \frac{6}{16} = \frac{3}{8}$ d) $P = \frac{3}{16}$