UNIT 3
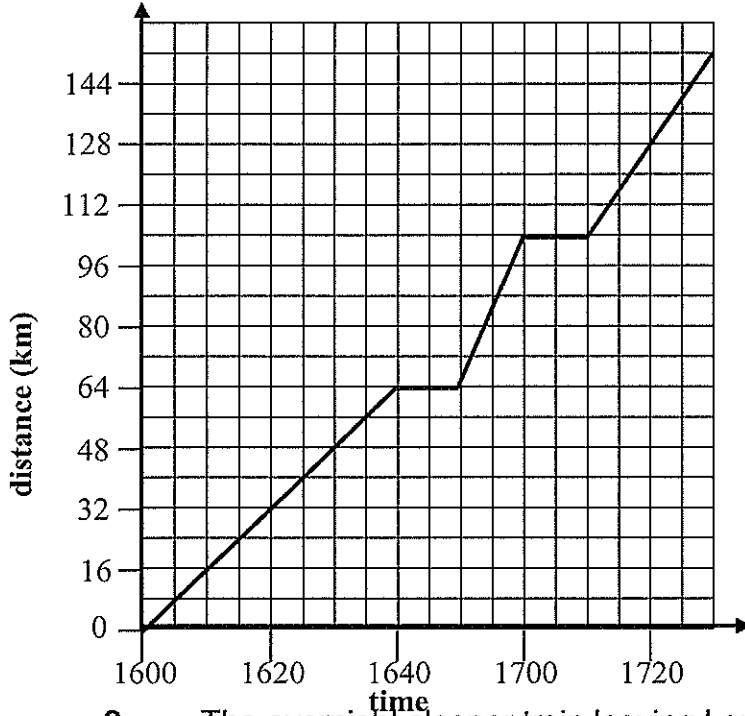**HW1 SPEED, DISTANCE,TIME**

Q1.

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

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

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

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

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

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

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

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

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

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

4.   A supersonic aircraft is flying at 2000 km/h.
   a.   If it flies at this speed from 1446 to 1610, what distance will it travel?
   b.   How many **seconds** will it take the plane to travel 20 kilometres?

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

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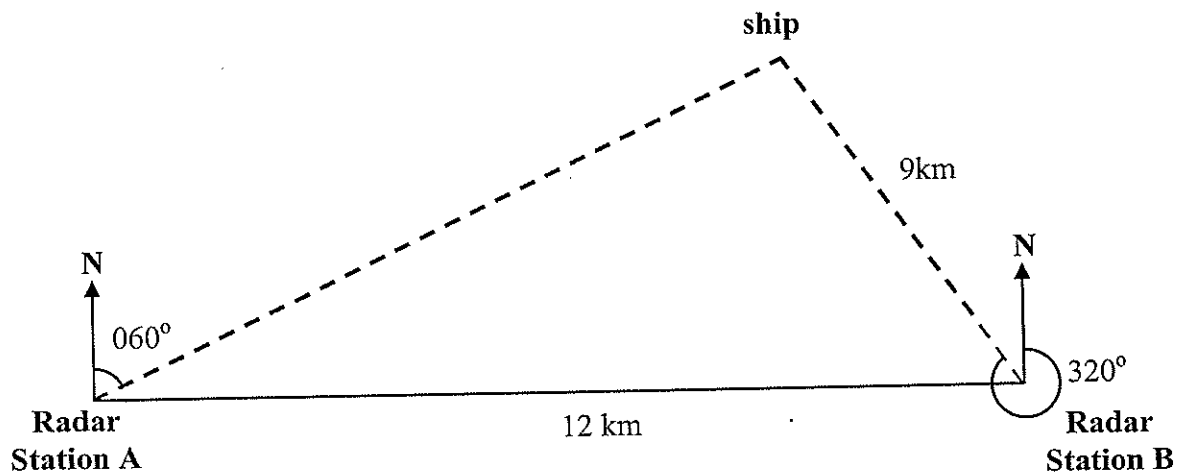   (Give your answer correct to 1 decimal place)

HW 2 SIMILAR SHAPES AND SCALE

Q1. Make a scale drawing for each of the situations below to find the height of each object.

a.

43°

|← 20 m →|

Scale : 1 cm to 2 m
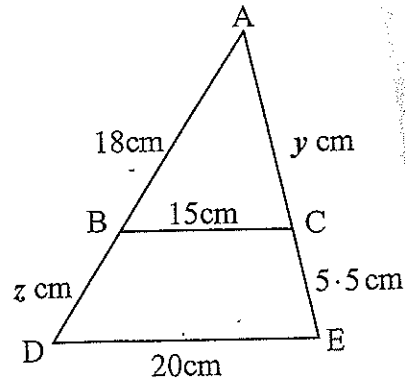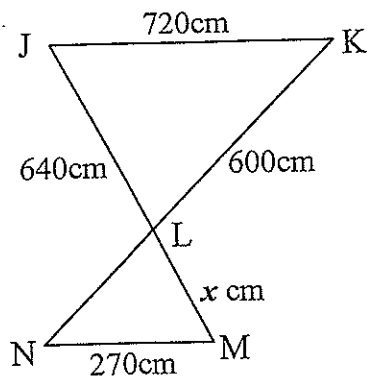
b.

35°

|← 72 m →|

Scale : 1 cm to 10 m
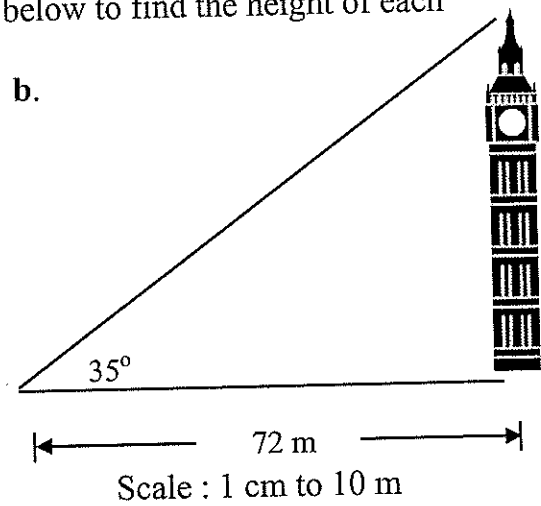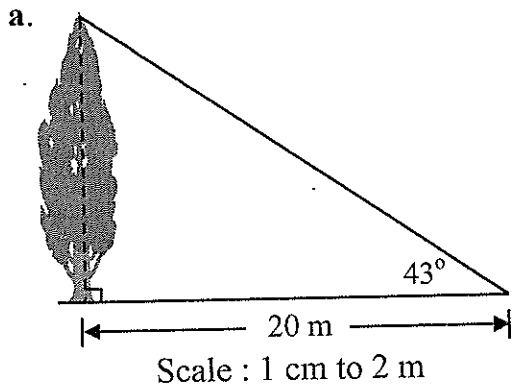
Q2. A ship is located by two radar stations as shown in the diagram. Make a scale drawing of the sketch shown below. Use a scale of 1 cm to 2 km.

ship

9km

N

060°

N

320°

Radar
Station A

12 km

Radar
Station B

Q3. Calculate the value of x, y and z in the diagrams below.

720cm
J ———————— K
640cm   600cm
        L
        x cm
N ——————— M
  270cm

A
18cm y cm
B   15cm   C
z cm   5·5 cm
D   20cm   E

Q4.

HAIR
WASH   12 cm

200ml

travel

HAIR
WASH h cm
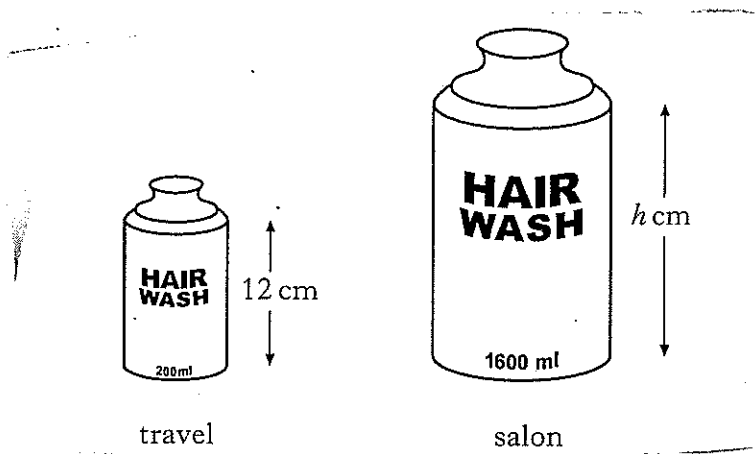
1600 ml

salon

Shampoo is available in travel size and salon size bottles.
The bottles are mathematically similar.
The travel size contains 200 millilitres and is 12 centimetres in height.
The salon size contains 1600 millilitres.
Calculate the height of the salon size bottle.

HW 3 PERSONAL FINANCE

1. The payslip shown below is Pat's first payslip.

Employee Number 0725	Employee Name Pat Gibson	Tax Code 255L	Week 1
Basic Pay 194.00	Overtime 21.00	Commission —	Gross Pay 215.00
Income Tax 34.80	Superannuation	National Insurance 12.90	Total Deductions 47.70
			Net Pay 167.30

    a. Explain the terms   i.   Gross Pay
                              ii.   Income Tax
                              iii.   National Insurance

    b. Explain how the Gross Pay, Total Deductions and Net pay have been calculated.

2. The *Nova Scotia Building Society* produces this table to help customers work out the repayments for their loan. The annual percentage rate (APR) is also shown.

NΣBΣ amount of loan (£)	without loan protection					with loan protection				
	12 months	24 months	36 months	48 months	APR %	12 months	24 months	36 months	48 months	APR %
500	46.13	25.26	18.38	15.01	20.9	49.90	27.70	20.60	17.13	18.9
1000	92.26	50.51	36.76	30.01		98.79	55.39	41.18	34.26	
3000	276.77	151.54	110.29	90.04		296.38	166.18	123.56	102.79	
5000	455.21	246.39	177.41	143.39	17.9	486.81	269.28	197.54	162.20	15.9
7000	637.29	344.94	248.37	200.74		681.54	377.00	276.56	227.08	
10000	902.24	484.52	346.3	277.94	15.9	936.97	528.29	383.98	312.42	13.9
15000	1353.37	726.79	519.45	416.91		1445.95	792.44	575.96	468.62	

    What is the APR for a loan of
    a.   £7000 without loan protection   b.   £15000 with loan protection
    c.   £500 with loan protection   d.   £1000 without loan protection

3. Maria decides to apply for a credit card and compares some of those available.

Credit Card	Annual Fee	APR	Monthly rate	Minimum Payment
Vista	£12	21.1	1.61	£5 or 5%
Silvercarp	none	19.8	1.52	£4 or 4%
Canadian Express	£15	28.8	2.13	£5 or 5%
National Direct	£10	18.6	1.43	£5 or 5%

(whichever is greater)

a. How much is the annual fee for Canadian Express ?
b. What is the APR for National Direct ?
c. What is the monthly rate of interest for Vista ?
d. What is the minimum payment for Silvercarp ?
e. If Maria spent £150, how much would her minimum payment be with Vista?
f. How much would it be with Silvercarp ?

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

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

6. Complete this electricity bill.

account issued	reference	Southern Electric	from	to
5th November	SEB013		1st Sep	1st Nov

meter readings		Details of charges		Amount
present	previous	standing charge		£13.50
19334	18202		units @ 8.65p	
			subtotal	
			VAT @ 17.5%	
			TOTAL BILL	

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

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

Calculate the monthly premium for
a. David, 29, smoker for £8000
b. Louise, 38, non-smoker for £5000

HW 4 FACTORISING

1. Factorise:-
(a) $3x + 12$
(b) $24p - 16q$
(c) $36a + 60$
(d) $ab + 6ac$
(d) $14cd - 7ce$
(e) $5x^2 + 15xy$

2. Factorise:-
(a) $w^2 - 64$
(b) $a^2 - b^2$
(c) $4x^2 - 49$
(d) $100x^2 - 25$

3. Factorise:-
(a) $x^2 + 6x + 9$
(b) $k^2 + 5k - 6$
(c) $x^2 - 10x - 24$
(d) $m^2 - 8m + 15$

4. Factorise fully-
(a) $5s^2 - 20$
(b) $3m^2 - 6m - 9$
(c) $12x^2 + 16x + 4$