

General Mathematics - Practice Examination G

Please note ... the format of this practice examination is the same as the current format. The paper timings are the same, as are the marks allocated.

Calculators may only be used in Paper 2.

MATHEMATICS **Standard Grade - General Level**

Paper I

Time Allowed - 35 minutes

First name and initials

Surname

Class

Teacher

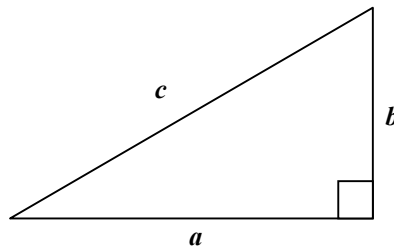
Read Carefully

1. Answer as many questions as you can.
2. Write your answers in the spaces provided .
3. Full credit will be given only where the solution contains appropriate working.
4. **You may not use a calculator**

FORMULAE LIST

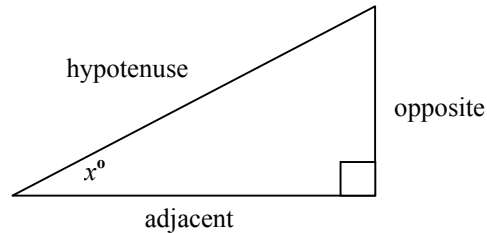
Circumference of a circle:	$C = \pi d$
Area of a circle:	$A = \pi r^2$
Curved surface area of a cylinder:	$A = 2\pi r h$
Volume of a cylinder:	$V = \pi r^2 h$
Volume of a triangular prism:	$V = Ah$

Theorem of Pythagoras:



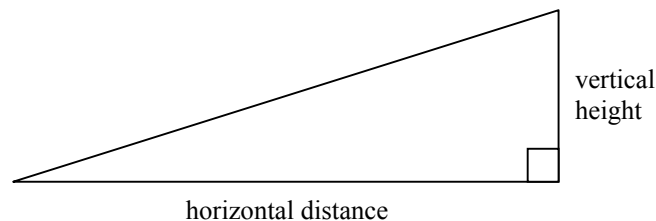
$$a^2 + b^2 = c^2$$

Trigonometrical ratios
in a right angled
triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$
$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$
$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Gradient:



$$\text{Gradient} = \frac{\text{vertical height}}{\text{horizontal distance}}$$

1. Carry out the following calculations.

(a) $7.31 - 4.642$

(1)

(b) 9.27×40

(1)

(c) $25.2 \div 6$

(1)

(d) $\frac{5}{6} + \frac{7}{18}$

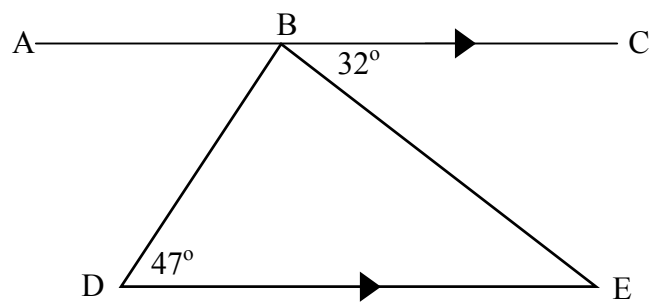
(2)

2. In the diagram below

- AC is parallel to DE
- Angle CBE = 32°
- Angle BDE = 47° .

Calculate the size of angle DBE.

(3)



3. (a) List all the **prime** numbers between 1 and 20 inclusive.

(2)

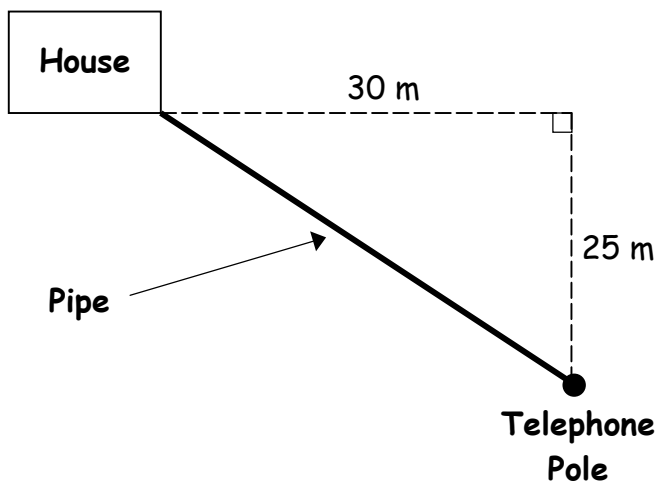
(b) What is the probability that a number chosen at random from the numbers 1 to 20 will be prime?

(2)

4. A rope has to be fed through a pipe in the ground for the telephone wire to be connected from the house to the telephone pole.

All dimensions are shown in the diagram.

John has a **40 metre** long rope to complete the job.



Is the rope long enough?

You must justify your answer with appropriate working.

(5)

5. The marks attained by 5 candidates in a test are shown.

Question	John	Aneela	Susan	Frank	Jane
1	32	50	49	31	16
2	43	40	44	32	42
3	24	44	49	29	37
4	19	31	42	28	6
5	14	46	47	19	25
6	21	43	50	24	9
Total	153	254			

(a) Complete the total scores for Susan, Frank and Jane.

(2)

(b) The marks for the individual questions are shown below.

Construct a stem and leaf diagram to represent this data.

(4)

32	50	49	31	16
43	40	44	32	42
24	44	49	29	37
19	31	42	28	6
14	46	47	19	25
21	43	50	24	9

(c) What is the median mark?

(1)

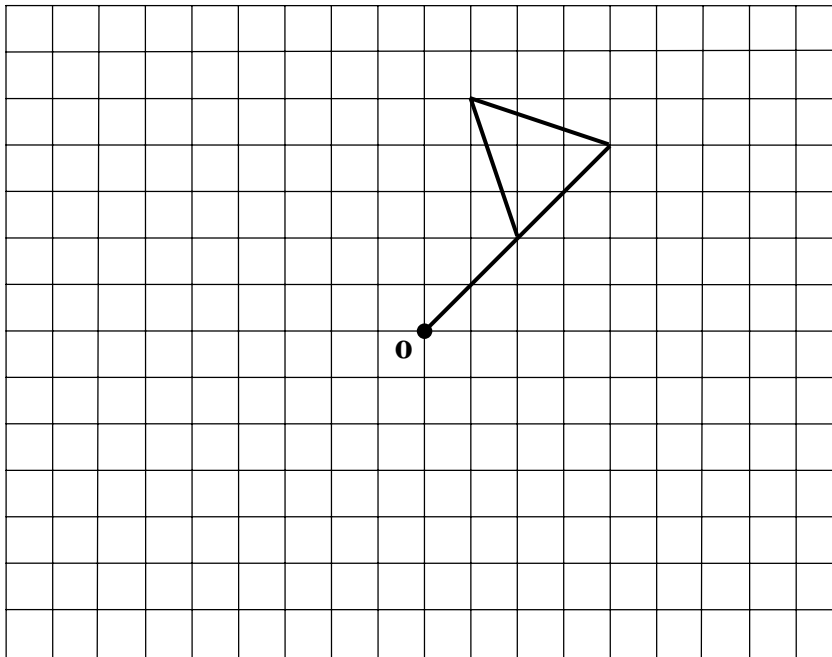
(d) The grades are calculated as follows using the total scores:

- A 255 – 300
- B 209 – 254
- C 165 – 208
- D 120 – 164
- E 75 – 119

Write down the grades attained by each of the 5 students.

(3)

6. Complete the diagram so that it has rotational symmetry of order 4 about the point **O**. (3)

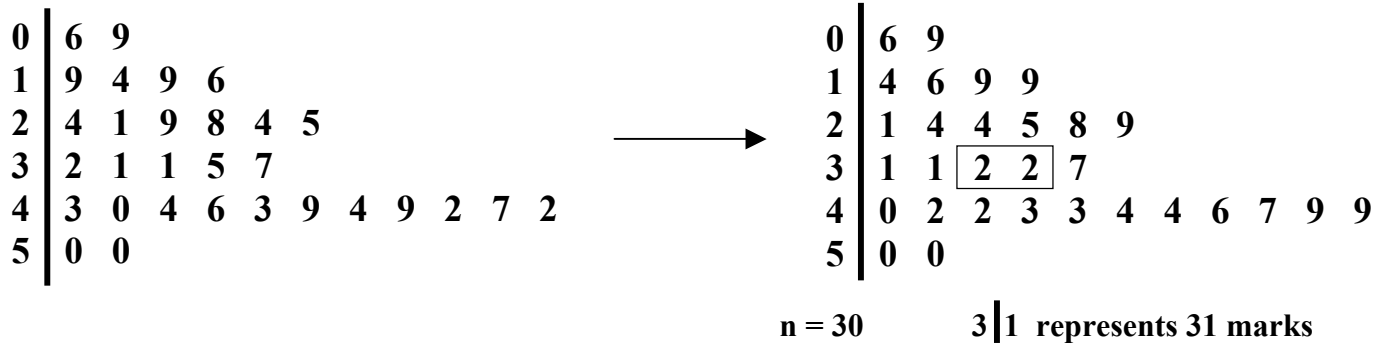


END OF QUESTION PAPER

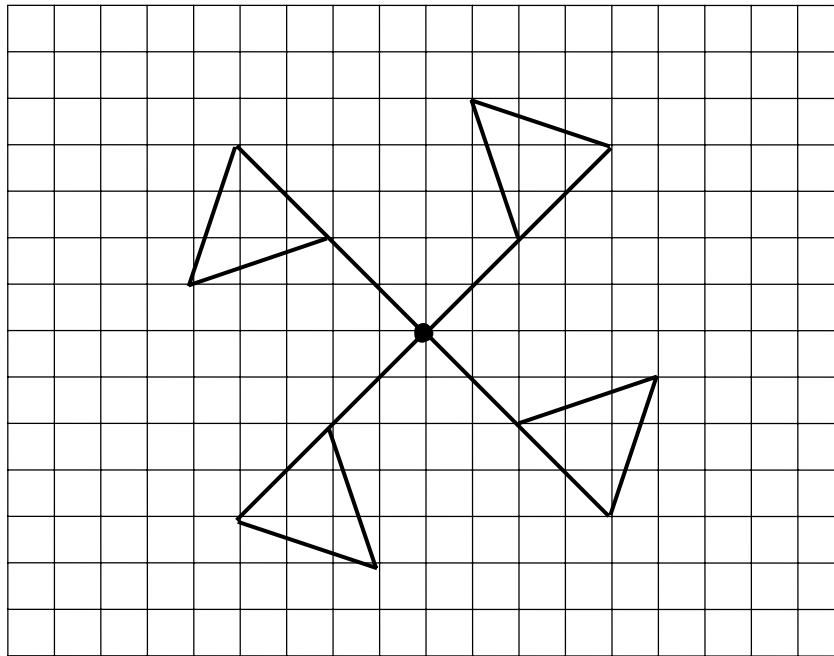
	Give 1 mark for each •	Illustrations for awarding each mark
1(a)	<ul style="list-style-type: none"> carry out calculation correctly 	<ul style="list-style-type: none"> 2.668
1(b)	<ul style="list-style-type: none"> carry out calculation correctly 	<ul style="list-style-type: none"> 370.8
1(c)	<ul style="list-style-type: none"> carry out calculation correctly 	<ul style="list-style-type: none"> 4.2
1(d)	<ul style="list-style-type: none"> knows to find common denominator carry out calculation correctly 	<ul style="list-style-type: none"> $\frac{15+7}{18}$ $1\frac{2}{9}$ ($\frac{22}{18}$)
		5 marks KU
2.	<ul style="list-style-type: none"> knows angle $BED = 32^\circ$ knows angles in triangle add up to 180° calculates correctly <p><i>Candidate can also find angle ABD and use property of straight angle.</i></p>	<ul style="list-style-type: none"> $\angle DBE = 180 - (47 + 32)$ $\angle DBE = 101^\circ$
		3 marks RE
3(a)	<ul style="list-style-type: none"> appears to know what a prime number is lists all of the prime numbers between 1 & 20 	<ul style="list-style-type: none"> 2, 3, 5, etc 2, 3, 5, 7, 11, 13, 17, 19
3(b)	<ul style="list-style-type: none"> counts no. of prime numbers divides this by 20 and simplifies 	<ul style="list-style-type: none"> 8 prime numbers (or whatever they have in their own list) $\frac{8}{20} = \frac{2}{5}$ or 0.4
		2 marks KU
4.	<ul style="list-style-type: none"> knows to use Pythagoras' Theorem Uses Pythagoras correctly knows to square length of rope squares correctly correct conclusion 	<ul style="list-style-type: none"> $30^2 + 25^2$ $900 + 625 = 1525$ 40^2 1600 rope is long enough since $1525 < 1600$
		5 marks RE
5(a)	<ul style="list-style-type: none"> one or two correct totals All three totals correct 	<ul style="list-style-type: none"> Susan – 281, Frank – 163, Jane – 135
5(b)	<ul style="list-style-type: none"> Stem correct Leafs correct Leafs re-ordered key present 	<ul style="list-style-type: none"> See diagram at end of Marking Scheme
5(c)	<ul style="list-style-type: none"> Reads off median correctly 	<ul style="list-style-type: none"> median = 32
5(d)	<ul style="list-style-type: none"> knows how to use table 2 or 3 correct grades attained 4 or 5 correct grades attained 	<ul style="list-style-type: none"> John – Grade D; Aneela – Grade B Susan – Grade A; Frank – Grade D Jane – Grade D
		3 marks RE

	Give 1 mark for each •	Illustrations for awarding each mark
6.	<ul style="list-style-type: none"> • Half turn symmetry correct • 1st quarter turn symmetry correct • 2nd quarter turn symmetry correct 	<ul style="list-style-type: none"> • See diagram below • • <p style="text-align: right;">3 Marks RE</p>

Question 5(b)



Question 6



Total Marks for Paper I : **KU 16**
 RE 14

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MATHEMATICS

Standard Grade - General Level

Paper II

Time Allowed - 55 minutes

First name and initials

Surname

Class

Teacher

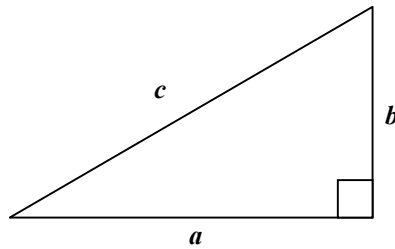
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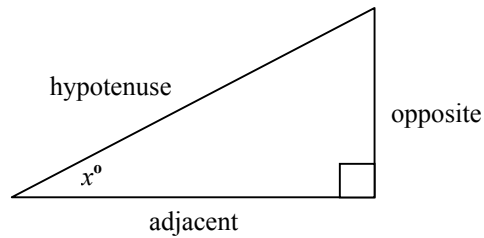
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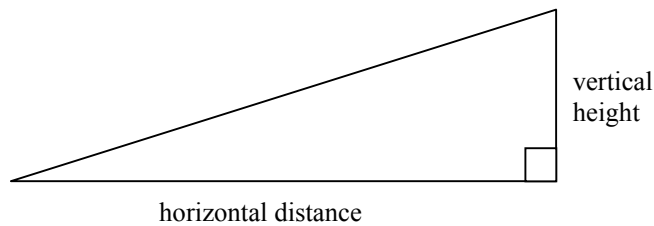
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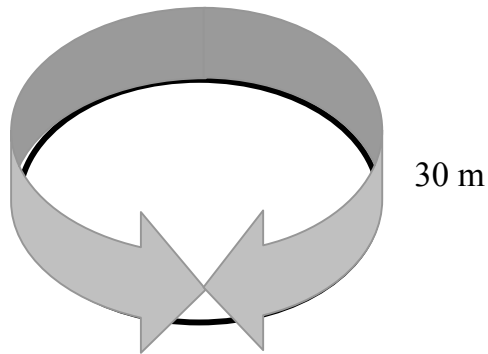
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Gradient:



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1. In the World's Strongest Man contest the men have to carry a heavy weight around the edge of a circle of circumference 30m.

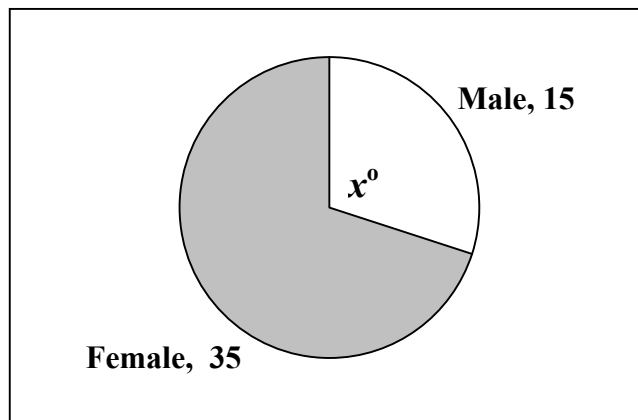


Calculate the area of this circle.

(4)

2. Adults in a community centre were asked to complete a questionnaire.

The pie chart shows the number of males and females who took part in the survey.



- (a) What percentage of people surveyed were male?

(3)

- (b) Calculate the size of angle x° in the pie chart.

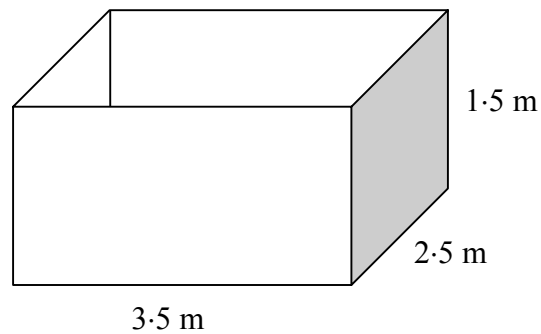
(2)

3. (a) There are 4.546 litres in one gallon.
How many **cubic metres** (m^3) are there in 3000 gallons?

(4)

- (b) Can 3000 gallons of oil fit in the tank shown below?

(2)



4. The distance between Liverpool and Norwich is 240 miles.
Sophie travelled between Liverpool and Norwich at an average speed of 50 mph.
How long, in hours and minutes, did it take Sophie to complete this journey?

(3)

5. (a) Solve the following equation

$$6x - 14 = 2(x + 5)$$

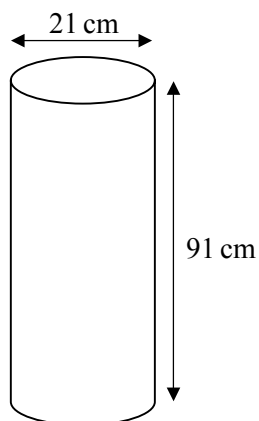
(3)

- (b) Factorise

$$27a^2 + 18ab$$

(3)

6. A painting was posted in a cylindrical tube of height 91 cm and diameter 21 cm .



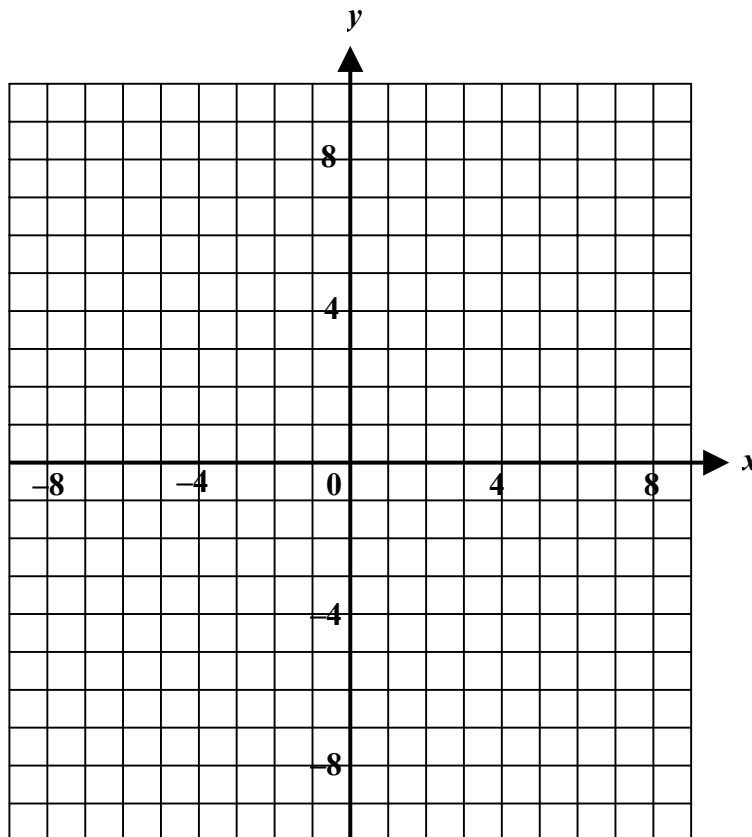
Calculate the curved surface area of the tube.

(3)

7. (a) Complete the table below for $y = 7 - 2x$. (2)

x	-1	3	5
y			

(b) Using the table above, draw the graph of the line $y = 7 - 2x$ on the grid below. (2)



(c) On the same grid draw the graph of the line $y = 3x - 3$. (3)

(d) At what point do the two lines intersect? (1)

8. $30 \times 29 \times 28 \times 27 \times \dots \times 3 \times 2 \times 1$ is equal to

265252859812191058636308480000000

Write this number in scientific notation, giving your answer to 3 decimal places.

(3)

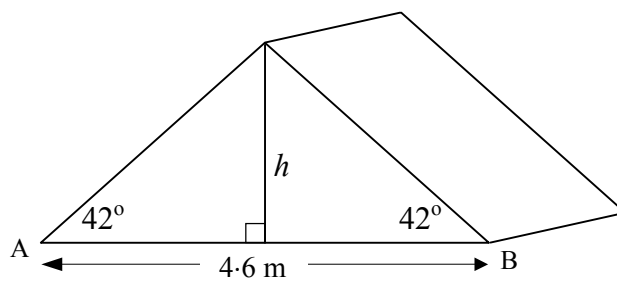
9. Marie works 39 hours per week as a school secretary.
Her basic rate of pay is £5.80 per hour with any overtime paid at time-and-a-half.

In one particular week her gross salary was £287.10.

How many hours of overtime did she work?

(4)

10. The distance between the tent pegs at A and B is 4.6 m and the angle of elevation of the sides of the tent is 42° , as shown.



Calculate the height, h , of the tent.

(4)

11. (a) Karen is always forgetting part of her mobile telephone number.

She only ever recalls the following information:

The number is 086 * * * 6404

The missing 3 digits form a square number

Two of these three digits are equal

List all possible combinations of the three missing digits.

(3)

- (b) Karen also remembered that the three digits add up to 16, itself a square number.

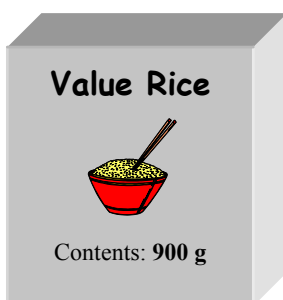
Use this additional information to write down Karen's telephone number.

(2)

12. The box of **Big Value Rice** has a special offer.

Calculate the missing percentage number which has been ripped from the label.

(3)



	Give 1 mark for each •	Illustrations for awarding each mark
1.	<ul style="list-style-type: none"> • knows how to find radius • finds radius correctly • knows how to calculate area • calculates area correctly 	<ul style="list-style-type: none"> • $30 = 2 \pi r ; r = 30 \div 2\pi$ • 4.77 m • $A = \pi r^2 = \pi \times 4.77^2$ • 71.48 m^2 <p style="text-align: right;">4 marks RE</p>
2(a)	<ul style="list-style-type: none"> • knows to add number of males and females • knows to divide no. of males by total • finds % correctly 	<ul style="list-style-type: none"> • $15 + 35 = 50$ • $15 \div 50$ • 30% <p style="text-align: right;">3 marks KU</p>
2(b)	<ul style="list-style-type: none"> • knows to calculate 30% of 360° or $\frac{3}{10}$ of 360° • calculates angle correctly 	<ul style="list-style-type: none"> • 0.3×360 etc. • 108° <p style="text-align: right;">2 marks KU</p>
3(a)	<ul style="list-style-type: none"> • knows to calculate no. of litres in 3000 gallons • calculates correctly • attempts to convert litres to cubic metres • converts correctly 	<ul style="list-style-type: none"> • 3000×4.546 • 13638 litres • $\div 1000$ or converts to ml first • 13.638 m^3 <p style="text-align: right;">4 marks RE</p>
3(b)	<ul style="list-style-type: none"> • finds volume of tank • correct conclusion (consistent with answer to (a)) 	<ul style="list-style-type: none"> • $3.5 \times 2.5 \times 1.5 = 13.125 \text{ m}^3$ • 3000 gallons will not fit in tank <p style="text-align: right;">2 marks RE</p>
4.	<ul style="list-style-type: none"> • knows how to find time • finds time correctly • converts correctly to hours and minutes 	<ul style="list-style-type: none"> • $T = D \div S$ • $T = 240 \div 50 = 4.8$ hours • 4 hours 48 minutes <p style="text-align: right;">3 marks KU</p>
5(a)	<ul style="list-style-type: none"> • multiplies correctly out of the brackets • gathers like terms correctly • finds x 	<ul style="list-style-type: none"> • $6x - 14 = 2x + 10$ • $6x - 2x = 10 + 14; 4x = 24$ • $x = 6$ <p style="text-align: right;">3 marks KU</p>
5(b)	<ul style="list-style-type: none"> • knows to put into brackets • finds common factor • finds correct terms inside bracket 	<ul style="list-style-type: none"> • • $9a$ • $9a(3a + 2b)$ <p style="text-align: right;">3 marks KU</p>
6.	<ul style="list-style-type: none"> • knows how to find curved surface area • substitutes correctly for r and h • correct answer 	<ul style="list-style-type: none"> • $2 \pi rh$ • $2 \times \pi \times 10.5 \times 91$ • 6003.58 cm^2 <p style="text-align: right;">3 marks KU</p>
7(a)	<ul style="list-style-type: none"> • any one correct entry • all three correct entries 	<ul style="list-style-type: none"> • • $-1 \rightarrow 9; 3 \rightarrow 1; 5 \rightarrow -3$ <p style="text-align: right;">2 marks KU</p>
7(b)	<ul style="list-style-type: none"> • points plotted correctly • line drawn through points 	<ul style="list-style-type: none"> • $(-1, 9), (3, 1), (5, -3)$ • graph <p style="text-align: right;">2 marks KU</p>
7(c)	<ul style="list-style-type: none"> • finds correct co-ordinates • plots points correctly • draws line through points 	<ul style="list-style-type: none"> • any suitable co-ordinates (minimum 2) • • <p style="text-align: right;">3 marks KU</p>

	Give 1 mark for each •	Illustrations for awarding each mark
7(d)	<ul style="list-style-type: none"> states point of intersection of two lines (consistent with candidate's graph) 	<ul style="list-style-type: none"> (2, 3) or otherwise <p style="text-align: right;">1 mark RE</p>
8.	<ul style="list-style-type: none"> finds number between 1 and 10 rounds number to 3 decimal places finds correct power 	<ul style="list-style-type: none"> 2.652528..... 2.653 2.653×10^{32} <p style="text-align: right;">3 marks KU</p>
9.	<ul style="list-style-type: none"> finds basis wage subtracts basic wage from gross salary finds rate of pay for overtime finds no. of hours of overtime worked 	<ul style="list-style-type: none"> $39 \times 5.80 = \text{£}226.20$ $287.10 - 226.20 = \text{£}60.90$ $5.80 \times 1.5 = \text{£}8.70$ $60.90 \div 8.70 = 7 \text{ hrs overtime}$ <p style="text-align: right;">4 marks RE</p>
10.	<ul style="list-style-type: none"> calculates adjacent side in triangle identifies correct trig ratio uses ratio correctly finds height of tent 	<ul style="list-style-type: none"> $4.6 \div 2 = 2.3 \text{ m}$ tangent ratio $\tan 42^\circ = \frac{h}{2.3}$ $h = 2.3 \tan 42^\circ = 2.07 \text{ m}$ <p style="text-align: right;">4 marks RE</p>
11(a)	<ul style="list-style-type: none"> Makes attempt at listing square numbers Lists all three digit square numbers (<i>may be implied</i>) Identifies numbers which have two digits equal 	<ul style="list-style-type: none"> 100, 121, 144, etc 100, 121, 144, 225, 400, 441, 484, 676, 900 <p style="text-align: right;">3 marks RE</p>
11(b)	<ul style="list-style-type: none"> identifies correct three digits identifies correct telephone number 	<ul style="list-style-type: none"> 484 086 484 6404 <p style="text-align: right;">2 marks RE</p>
12.	<ul style="list-style-type: none"> subtracts to find extra amount in grms knows to divide difference by 900 (i.e. constructs a fraction) multiplies by 100 to convert to % 	<ul style="list-style-type: none"> $1035 - 900 = 135\text{g}$ $\frac{135}{900}$ $\frac{135}{900} \times 100 = 15\%$ <p style="text-align: right;">3 marks RE</p>

Total Marks for Paper II :

KU	27
RE	27

Total marks for Papers I and II	KU	43	RE	41
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