Past Papers Worksheet P4 Upper and Lower Bounds IGCSE Mathematics 0580

1. A circle has a radius of 8.5cm correct to the nearest 0.1cm. The lower bound for the area of the circle is $p\pi$ cm^2. The upper bound for the area of the circle is $q\pi$ cm^2.
   Find the value of p and the value of q. [3]
   0580/22/O/N/13 Q12)

2. The sides of a square are 15.1cm, correct to 1 decimal place.
   Find the upper bound of the area of the square [2]
   0580/21/O/N/19 Q12)

3. Joe measures the side of a square correct to 1 decimal place.
   He calculates the **upper** bound for the area of the square as $37.8225cm^2$.
   Work out Joe's measurement for the side of the square. [2]
   0580/22/M/J/13 Q8)

4. In 2016, a company sold 9600 cars, correct to the nearest hundred
   (i) Write down the lower bound for the number of cars sold [1]
   (ii) The average profit on each car sold was $2430, correct to the nearest $10.
   Calculate the lower bound for the total profit. Write down the exact answer. [2] **0580/43/M/J/17 Q1(a)**

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5. On one day, the number of members using the exercise machines was 40, correct to the nearest 10. Each member used a machine for 30 minutes, correct to the nearest 5 minutes.
   Calculate the lower bound for the number of minutes the exercise machines were used on this day. [2]
   0580/41/M/J/18 Q10(b)

6. A fence is made from 32 identical pieces of wood, each of length 2 metres correct to the nearest centimetre. Calculate the lower bound for the total length of the wood used to make this fence in metres. Write down your full calculator display. [3]
   0580/22/M/J/10 Q9)

7. A cuboid measures 10 cm by 4 cm by 6 cm.
   Each side is measured correct to the nearest centimetre.
   Complete the inequality for the volume, V, of this cuboid.
   $_____\text{cm}^3 \leqslant V < _____\text{cm}^3$ [3]
   0580/43/O/N/21 Q3(b)

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8. Pasta is sold in packets with width 11.5 cm, correct to the nearest 0.5cm.



A shop places these packets in a single line on a shelf of length 2m, correct to the nearest 0.1m.
Find the maximum number of these packets that will fit along this shelf.
You must show all your working.
0580/43/O/N/22 Q1(c)

9. The volume of a cuboid is 878cm^3, correct to the nearest cubic centimetre.
The length of the base of the cuboid is 7cm, correct to the nearest centimetre.
The width of the base of the cuboid is 6cm, correct to the nearest centimetre.
Calculate the lower bound for the height of the cuboid [3]
0580/23/O/N/15 Q20)

10. (a) A bag of rice has a mass of 25kg, correct to the nearest kilogram.
Calculate the lower bound of the total mass of 10 of these bags. [1]
(b) Virat has 200 metres of wire, correct to the nearest metre.
He cuts the wire into *n* pieces of length 3 metres, correct to the nearest 20 centimetres.
Calculate the largest possible value of *n*.[3]
0580/22/F/M/21 Q22)

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11. Maria paints a rectangular wall.
The length of the wall is 20.5m and the height is 2.4 m, both correct to 1 decimal place.
One litre of paint covers an area of exactly $10m^2$.
Calculate the smallest number of 2.5-litre tins of paint she will need to be sure all the wall is painted. Show all your working [4]
0580/42/M/J/21 Q1(c)

12. (a) John wants to estimate the value of π. He measures the circumference of a circular pizza as 105 cm and its diameter as 34 cm, both correct to the nearest centimetre. Calculate the lower bound of his estimate of the value of π. Give your answer correct to 3 decimal places. [4]
(b) The volume of a cylindrical can is 550 cm^3, correct to the nearest 10 cm^3. The height of the can is 12 cm correct to the nearest centimetre.
Calculate the upper bound of the radius of the can.
Give your answer correct to 3 decimal places. [5]
0580/41/O/N/11 Q9

13. One lap of the race track measures 3720 metres, correct to the nearest 10 metres.
A car completed the lap in 75 seconds, correct to the nearest second.
Calculate the upper bound for the average speed of this car.
Give your answer in kilometres per hour. [4]
0580/41/M/J/17 Q2(d)

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14. On a journey, the train took 73 minutes, correct to the nearest minute, to travel 215 km, correct to the nearest 5km. Calculate the upper bound of the average speed of the train for this journey. Give your answer in km/h. [4]
0580/43/O/N/17 Q3(c)

15. Ellie drives a car at a constant speed of 30 m/s correct to the nearest 5 m/s.
She maintains this speed for 5 minutes correct to the nearest 10 seconds.
Calculate the upper bound of the distance in kilometres that Ellie could have travelled. [5]
0580/43/O/N/14 Q9(c)

16. (a) V = IR
In an experiment I and R are both measured correct to 1 decimal place.
When I = 4.0 and R = 2.7, find the **lower** bound for V. [2]
(b) S = D/T
In an experiment D and T are both measured correct to 2 significant figures.
When D = 7.6 and T = 0.23, find the **upper** bound for S. [2]
0580/23/M/J/16 Q17

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Answers

1) p = 71.4025 , q = 73.1025	7) 182.875…307.125	13) 180
2) 229.5225	8) 18	14) 180
3) 6.1	9) 18	15) 9.9125
4) (i) 9550 (ii) 23 158 750	10) (a)245 (b)69	16) (a) 10.4675 (b) 34
5) 962.5	11) 3	
6) 63.84	12) (a) 3.028 or 3.029 (b) 3.919	

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