

Applying Limits of Accuracy

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Examples



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Question 1: India has pieces of ribbon, each measuring 7cm to the nearest centimetre.

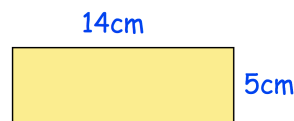
- (a) find the least total length of 10 pieces of ribbon.
- (b) find the greatest total length of 10 pieces of ribbon.

Question 2: Leon has four barrels, each with a mass of 30kg to the nearest 10 kg.

- (a) find the the minimum possible mass of the four barrels.
- (b) find the maximum possible mass of the four barrels.

Question 3: A rectangle has a length of 14cm and width of 5cm, both to nearest centimetre.

- Find
- (a) the maximum possible area and
 - (b) the minimum possible area.



Question 4: The classes in a primary school have 20 students to the nearest 10.
There are 7 classes in the primary school.
Work out the greatest possible number of students that attend the school.

Question 5: Harry and Peter take part in a race.
It took Harry 30 seconds to the nearest 10 seconds to finish the race.
It took Peter 43 seconds to the nearest second to finish the race.
Work out the minimum possible difference between their finishing times.

Question 6: An average orange weighs 131g to the nearest gram.
A net contains 8 oranges.
The net weighs 10g to the nearest gram

What is the maximum possible weight of the net of oranges?

Question 7: Megan has 2 litres of fruit juice to the nearest litre.
She pours the fruit juice into glasses that hold 100ml to the nearest 10ml.
Work out the lowest possible number of glasses she can fill.

Question 8: A rectangular football pitch has a width of 72m, measured to the nearest metre.
The length of the pitch is 105m, measured to the nearest 5 metres.

Work out the lower bound for the perimeter of the pitch.

Question 9: The lengths of time taken for 4 people to complete a puzzle are listed below.
Each time is given to one decimal place.

20.8 seconds 35.1 seconds 19.7 seconds 41.3 seconds

- (a) Work out the greatest possible range
(b) Work out the smallest possible mean.

Question 10: Mr Rodgers wants to keep 28 new maths textbooks on a shelf in his classroom.
Each book has a mass of 700g correct to 1 significant figure.
The shelf can hold up to 20kg to the nearest kilogram.
Can the shelf safely hold the textbooks?

Question 11: The base of a triangle is 30cm, correct to 2 significant figures.
The height of the triangle is 40cm, correct to 1 significant figure.
Calculate the upper bound for the area of the triangle

Question 12: Kelly drove a distance of 120 miles, to the nearest 10 miles, in a time of 2 hours,
to the nearest hour.
Work out the difference between Kelly's greatest possible and lowest possible
average speed.

Question 13: Rosie is buying strawberries, apples and grapes for a picnic.
She buys 4kg of strawberries and 3kg of grapes, both to the nearest kilogram.
Rosie buys 50 apples to the nearest 10 apples.
A kilogram of strawberries costs £1.20 to the nearest 10p
A kilogram of grapes costs £1.30 to the nearest 10p
An apple costs 20p each to the nearest 10p.
Work out the upper bound for the amount of money Rosie would have to pay

Question 14: A circle has an area of 600cm^2 to 2 significant figures.
Work out the lower bound of the radius.

Question 15: $w = aT$
Given $a = 15$ correct to 2 significant figures
and $w = 700$ correct to 2 significant figures
Calculate the upper bound for T

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Question 16: Shane estimated the distance between Cardiff and Swansea is 40 miles and that his average driving speed would be 60 mph.

He estimated the distance to the nearest 5 miles and the speed to the nearest 10mph.

Calculate the upper bound for the time the journey should take.
Give your answer to the nearest minute.

Question 17: A solid metal sphere has a radius of 4cm to 1 significant figure.
The sphere has a mass of 1200g to 2 significant figures.

Work out the lower bound for the density of the metal.

Question 18: The final velocity of a traveling object is given by the formula, $v = u + at$

where v is the final velocity
 u is the initial velocity
 a is the acceleration
and t is the time.

Given $u = 5.4\text{m/s}$ correct to 1 decimal place
 $a = 4.9\text{m/s}^2$ correct to 1 decimal place
 $v = 25.32$ correct to 2 decimal places

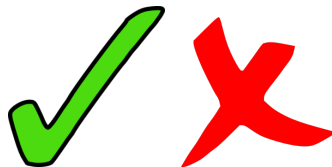
Calculate the upper bound for t .

Question 19: The population of a country is 6.4×10^6 to the nearest hundred thousand

The area of country is $8.4 \times 10^4 \text{ km}^2$ to the nearest 100km^2

Calculate the lower bound of the population density.

Answers



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