



EXAM PAPERS PRACTICE

Bounds

Model Answers

Question 1

The cost of making a chair is \$28 correct to the nearest dollar.

Calculate the lower and upper bounds for the cost of making 450 chairs.

Answer:

Now, we need to find the lower and upper bounds for the cost of making 450 chairs. To do this, we simply multiply the lower and upper bounds of the cost of making a single chair by 450. Lower bound: $\$27.50 \times 450 = 12375$ Upper bound: $\$28.49 \times 450 = 12820.50$ So, the lower and upper bounds for the cost of making 450 chairs are $\boxed{12375}$ and $\boxed{12820.50}$.

Question 2

The sides of an equilateral triangle are 9.4 cm, correct to the nearest millimetre.

Work out the upper bound of the perimeter of this triangle.

Answer:

*First, we need to understand that "correct to the nearest millimetre" means the actual length could be up to 0.5mm more than the stated length. So, the upper bound of the length of one side of the triangle is $9.4\text{cm} + 0.05\text{cm} = 9.45\text{cm}$. Since an equilateral triangle has three sides of equal length, the upper bound of the perimeter is $3 * 9.45\text{cm} = 28.35\text{cm}$.*

Question 3

A metal pole is 500cm long, correct to the nearest centimetre.

The pole is cut into rods each of length 5.8 cm, correct to the nearest millimetre.

Calculate the largest number of rods that the pole can be cut into

Answer:

First, we need to convert the length of the pole into millimetres because the length of the rods is given in millimetres. $1\text{ cm} = 10\text{ mm}$, so $500\text{ cm} = 5000\text{ mm}$.

Next, we divide the total length of the pole by the length of each rod to find out how many rods we can get. $5000\text{ mm} \div 5.8\text{ mm} = 862.07$ Since we can't have a fraction of a rod, we round down to the nearest whole number. So, the largest number of rods that the pole can be cut into is 862.

Question 4

A rectangle has length 5.8cm and width 2.4cm, both correct to 1 decimal place.

Calculate the lower bound and the upper bound of the perimeter of this rectangle.

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Answer:

First, we need to understand what "correct to 1 decimal place" means. It means that the actual length and width of the rectangle could be anything from 0.05 less to 0.05 more than the given measurements. So, the lower bound of the length is $5.8 - 0.05 = 5.75\text{cm}$ and the upper bound is $5.8 + 0.05 = 5.85\text{cm}$. Similarly, the lower bound of the width is $2.4 - 0.05 = 2.35\text{cm}$ and the upper bound is $2.4 + 0.05 = 2.45\text{cm}$.

The perimeter of a rectangle is calculated by the formula $2 \times (\text{length} + \text{width})$. So, the lower bound of the perimeter is $2 \times (5.75 + 2.35) = 16.2\text{cm}$ and the upper bound of the perimeter is $2 \times (5.85 + 2.45) = 16.6\text{cm}$.

Question 5

One year ago Ahmed's height was 114cm.

Today his height is 120 cm.

Both measurements are correct to the nearest centimetre.

Work out the upper bound for the increase in Ahmed's height

Answer:

First, we need to consider the possible range of Ahme

Next, we consider the possible range of Ahmed's height today. Similarly, his height could be anywhere from 119.5 cm to 120.5 cm. The increase in Ahmed's height is the difference between his height today and his height one year ago. To find the upper bound for this increase, we subtract the smallest possible height one year ago from the largest possible height today. So, the upper bound for the increase in Ahmed's height is $120.5 \text{ cm} - 113.5 \text{ cm} = 7 \text{ cm}$.

Question 6

The length, l metres, of a football pitch is 96m, correct to the nearest metre.

Complete the statement about the length of this football pitch.

Answer:

$$\text{Lower Bound} = 95.5\text{m}$$

$$\text{Upper Bound} = 96.5\text{m}$$

Length of football pitch (l) is = 96m

$$\text{Lower Bound} \quad \frac{96 + 95}{2} = \frac{191}{2} = 95.5\text{m}$$

$$\text{Upper Bound} \quad \frac{96 + 97}{2} = \frac{193}{2} = 96.5\text{m}$$

Question 7

The length, p cm, of a car is 440cm, correct to the nearest 10cm.

Complete the statement about p .

Answer:

435 cm

The length, p cm, of a car is 440cm, correct to the nearest 10cm. Complete the statement about p . The value of p lies in the range $435 \leq p < 445$. The value 435 represents the lower bound of the range, indicating that the car's length can be equal to or greater than 435 centimeters.

Question 8

An equilateral triangle has sides of length 16.1cm, correct to the nearest millimetre.

Find the lower and upper bounds of the perimeter of the triangle

Answer:

*Calculate the lower and upper bounds of the perimeter. An equilateral triangle has three equal sides, so to find the lower and upper bounds of the perimeter, we simply multiply the lower and upper bounds of the side length by 3. Lower bound of perimeter = $16.05 \text{ cm} * 3 = 48.15 \text{ cm}$ Upper bound of perimeter = $16.15 \text{ cm} * 3 = 48.45 \text{ cm}$ So, the lower and upper bounds of the perimeter of the equilateral triangle are 48.15 cm and 48.45 cm, respectively.*

Question 9

A large water bottle holds 25 litres of water correct to the nearest litre.

A drinking glass holds 0.3 litres correct to the nearest 0.1 litre.

Calculate the lower bound for the number of glasses of water which can be filled from the bottle.

Answer:

To find the lower bound for the number of glasses of water which can be filled from the bottle, we divide the lower bound for the bottle's volume by the upper bound for the glass's volume. So, the lower bound for the number of glasses is $24.5 \text{ litres} / 0.35 \text{ litres} = \text{approximately } 70 \text{ glasses}$.

Question 10

A carton contains 250 ml of juice, correct to the nearest millilitre.

Complete the statement about the amount of juice, j ml, in the carton.

Answer:

The carton contains 250 ml of juice, correct to the nearest millilitre. This means that the actual amount of juice in the carton could be anywhere from 249.5 ml to 250.5 ml.

Therefore, the statement about the amount of juice, j ml, in the carton is $249.5 \leq j < 250.5$.