



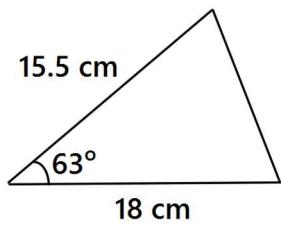
BOUND CALCULATIONS

- 1) A rectangle has a length of 7 m and a width of 4 m, each rounded to the nearest metre.
 - a. What is the minimum possible perimeter of the rectangle?
 - b. What is the maximum possible area of the rectangle?
- 2) Jupiter's diameter is 142,000 km to the nearest thousand. Saturn's diameter is 120,500 km to the nearest 500 km. Work out the minimum difference in their diameters.
- 3) A cyclist travelled 48 km to the nearest kilometre at a speed of 16 km/h, correct to the nearest km/h. Work out the maximum time travelled. Give your answer in hours and minutes, to the nearest minute.
- 4) The radius of a circle is 6 cm to the nearest cm.
 - a. Work out the maximum circumference of the circle. Give your answer in terms of π .
 - b. Work out the minimum area. Give your answer to 2 decimal places.
- 5) The height of plants measure: 7.2 cm, 5.8 cm, 6.5 cm, 6.9 cm, 7.0 cm, each to the nearest tenth.
 - a. Work out the greatest possible mean.
 - b. Work out the smallest possible median.
- 6) A frame has a length of 3.2 m and a width of 1.5 m, both to 1 decimal place. Work out the maximum possible area of the frame.
- 7) The length of a square field is measured as 40 m to the nearest metre. Find the minimum possible area of the field.
- 8) A circular pond has a radius of 8 m, correct to the nearest metre. Work out the maximum circumference. Give your answer in terms of π .
- 9) A parcel has a mass of 2.4 kg, correct to the nearest 0.1 kg. Work out the maximum mass of the parcel.
- 10) A string is measured as 12.5 m, correct to the nearest 0.1 m. Find the minimum possible length.
- 11) A cube has side length 6 cm, correct to the nearest cm. Work out the maximum possible volume.
- 12) $a = b - c$
 $b = 3.54$ correct to 2 decimal places
 $c = 2.168$ correct to 3 decimal places
Work out the upper bound of a .
- 13) $x = \frac{y}{z}$
 $y = 10.2$ correct to 3 significant figures
 $z = 0.5$ correct to 1 decimal place
Work out the lower bound of x .
- 14) $m = np$
 $n = 5.46$ correct to 2 decimal places
 $p = 10$ correct to 2 significant figures
Work out the lower bound of m .
- 15) A rectangular swimming pool is measured $10 \text{ m} \times 4 \text{ m}$, both to the nearest metre. Work out the maximum possible perimeter.

16) A cylinder has radius 4.0 cm to 1 decimal place and a height of 12 cm to the nearest centimetre. Given that the cylinder weights 200 g to the nearest gram, work out the minimum possible density to 2 decimal places.

17) A car travels 150 km, correct to the nearest km, in 2 hours, correct to the nearest tenth. Work out the minimum possible average speed. Give your answer to 1 decimal place.

18) A triangle is pictured below. The length 15.5 cm has been rounded to 1 decimal place. The length 18 cm has been rounded to 2 significant figures. The angle 63° has been rounded to the nearest degree. Work out the lower bound of the area of the triangle. Give your answer to 1 decimal place.



19) $y = \frac{3x}{k}$
 $x = 12.4$ correct to 3 significant figures
 $k = 7.01$ correct to 3 significant figures
By considering bounds, work out the value of y to a suitable degree of accuracy. Give a reason for your answer.

20) The area of a circle is given by the formula $A = \pi \times r^2$. The radius of the circle is measured as 4.00 cm, correct to 2 decimal places. By considering bounds, work out the value of the area of the circle to a suitable degree of accuracy. Give a reason for your answer.

21) A runner completes a distance of 1500 m in a recorded time of 4.8 minutes, correct to 1 decimal place. By considering bounds, work out the runner's speed in m/s to a suitable degree of accuracy. Give a reason for your answer.

22) The kinetic energy of a meteor is given by

$$KE = \frac{1}{2}mv^2$$

The mass of the meteor, m , is 3.62 kg, correct to 3 significant figures. The velocity of the meteor, v , is 1000 m/s, correct to 4 significant figures. By considering bounds, work out the value of KE to a suitable degree of accuracy. Give a reason for your answer.

Challenge

23) In triangle DEF

$$d^2 = e^2 + f^2 - (2ef \cos D)$$

where d is the side opposite angle D .

$e = 7.6$ cm, correct to 1 decimal place

$f = 5.42$ cm, correct to 3 significant figures

$D = 38^\circ$, correct to the nearest degree

By considering bounds, work out the value of d to a suitable degree of accuracy. Give a reason for your answer.