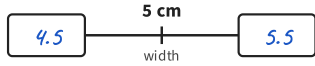
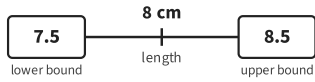


Bounds in Calculations

1 greatest area: use both upper bounds

A rectangle is 8 cm by 5 cm, each to the nearest cm. Find the **greatest** possible area.

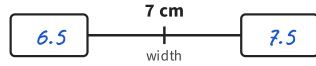
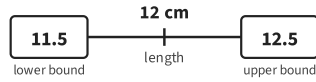


Greatest area = 8.5×5.5

Answer 46.75 cm²

2

A rectangle is 12 cm by 7 cm, each to the nearest cm. Find the **least** possible area.

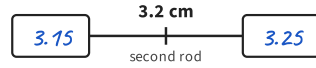
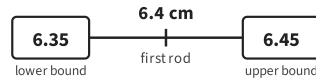


Least area = 11.5×6.5

Answer 74.75 cm²

3

Two rods are 6.4 cm and 3.2 cm long, each to 1 decimal place. Find the **greatest** possible total length.

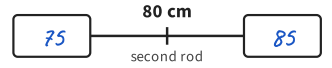
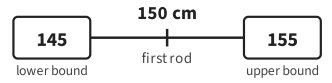


Greatest total = $6.45 + 3.25$

Answer 9.7 cm

4

Two rods are 150 cm and 80 cm long, each to the nearest 10 cm. Find the **least** possible total length.

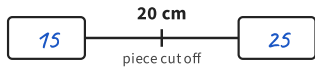
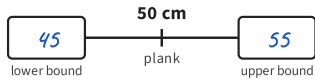


Least total = $145 + 75$

Answer 220 cm

5 *Notice the change!*

A plank is 50 cm long. A piece 20 cm long is cut off. Both are to the nearest 10 cm. Find the **greatest** possible length left.

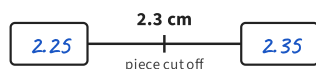
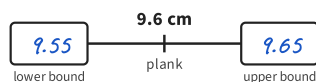


Greatest length = $55 - 15$

Answer 40 cm

6

A plank is 9.6 cm long. A piece 2.3 cm long is cut off. Both are to 1 decimal place. Find the **least** possible length left.

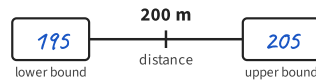


Least length = $9.55 - 2.35$

Answer 7.2 cm

7

A runner covers 200 m, to the nearest 10 m, in 25 s, to the nearest second. Find the **greatest** possible speed.

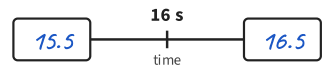
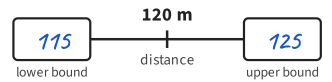


$205 \div 24.5$

Answer 8.37 m/s (2 d.p.)

8

A runner covers 120 m, to the nearest 10 m, in 16 s, to the nearest second. Find the **least** possible speed.



$115 \div 16.5$

Answer 6.97 m/s (2 d.p.)

Bounds in Calculations *further practice*

9

A stone has a mass of 450 g, to the nearest 10 g. Its volume is 60 cm³, to the nearest cm³. Find the **least** possible density. Give your answer to 2 decimal places.

$445 \div 60.5$

Answer 7.36 g/cm³

10

A circle has a radius of 6 cm, to the nearest cm. Find the **greatest** possible area of the circle. Give your answer to 1 decimal place.

$\pi \times 6.5^2$

Answer 132.7 cm²

11

A rectangle has an area of 50 cm², to the nearest cm². Its length is 8 cm, to the nearest cm. Find the **greatest** possible width. Give your answer to 2 decimal places.

$50.5 \div 7.5$

Answer 6.73 cm

12

A lift has a safe load of 1000 kg, to the nearest 100 kg. Thirteen boxes each weigh 72 kg, to the nearest kg. Can you be certain that the lift can safely carry all thirteen boxes at once? Show how you know.

$13 \times 72.5 = 942.5$, least load 950

Answer Yes, 942.5 kg < 950 kg

13

$a = 3.2$, $b = 5.7$ and $c = 2.4$, each to 1 decimal place. Find the **greatest** possible value of $\frac{a+b}{c}$. Give your answer to 2 decimal places.

$\frac{3.25 + 5.75}{2.35}$

Answer 3.83

14

Sam has a ribbon 2 m long, to the nearest 10 cm. He cuts pieces that are each 15 cm long, to the nearest cm. What is the **greatest** number of pieces Sam can be certain of cutting?

$195 \div 15.5 = 12.58...$

Answer 12 pieces

15

A train travels 150 km, to the nearest km, in 2.5 hours, to the nearest tenth of an hour. Find the bounds of its average speed. Then give the speed to an accuracy that both bounds round to.

61.4... and 58.6..., both 60 to 1 s.f.

Answer 60 km/h

16

$a = 9$ and $b = 4$, each to the nearest whole number. Zoe says the least possible value of $a - b$ is $8.5 - 3.5 = 5$. Is Zoe right? Explain.

use the upper bound of 6

Answer No, $8.5 - 4.5 = 4$