



## Bounds Exam Practice

### Bounds with addition/subtraction

- Q1. Let  $a$  and  $b$  be such that  $a$  is 3 and  $b = 7$  to the nearest whole number.
- (a) Work out a lower bound for  $a + b$  (2 marks)
- (b) Work out an upper bound for  $a + b$ . (2 marks)
- Q2. Let  $a$  and  $b$  be such that  $a$  is 5.7 and  $b = 14.2$  correct to 1 decimal place.  
Work out a lower bound and an upper bound for  $a + b$ . (2 marks)
- Q3. Let  $a$  and  $b$  be such that  $a$  is 16.74 and  $b = 9.23$  correct to 2 decimal places.  
Work out a lower bound and an upper bound for  $a - b$ . (2 marks)

### Bounds with Multiplication/Division

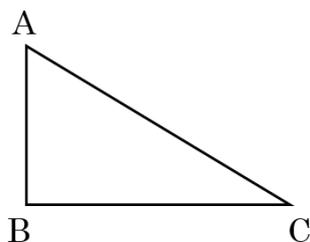
- Q4. Let  $a$  and  $b$  be such that  $a$  is 5.7 and  $b = 14.2$  correct to 1 decimal place.
- (a) Work out a lower bound for  $ab$  (2 marks)
- (b) Work out an upper bound for  $ab$ . (2 marks)
- Q5. Let  $r$  and  $s$  be such that  $r$  is 5.7 and  $s = 14.2$  correct to 1 decimal place.  
Work out a lower bound and an upper bound for  $\frac{r}{s}$ . (4 marks)
- Q6. Let  $a$  and  $b$  be such that  $a$  is 24 and  $b = 13$  to the nearest whole number.  
Work out a lower bound and upper bound for  $\frac{a}{b}$ . (4 marks)

### Applied Mixed Practice Problems

- Q7. A rectangle has a length of 34 cm, to the nearest cm, and a width of 10.3 cm, to the nearest mm.
- (a) Work out a lower bound for the area of the rectangle. (2 marks)
- (b) Work out an upper bound for the perimeter of the rectangle. (2 marks)



Q8.



ABC is a right-angled triangle with lengths  $AB = 3.2$  and  $BC = 7.8$  correct to 1 decimal place.

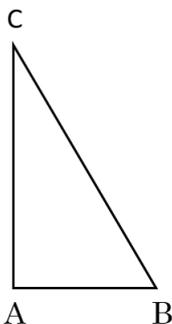
Work out the length of AC to an appropriate degree of accuracy.

(4 marks)

- Q9. Rob wishes to stack a set of books into a box. Each book is a cuboid which has height 125 mm to the nearest mm. If the box measures 1.38 m in height to the nearest cm, show that it may not be possible to put 11 books in the box and close the lid.

(3 marks)

Q10.



ABC is a right-angled triangle with lengths  $AB = 20$  cm and  $BC = 48$  cm correct to the nearest cm.

Find the length of AC to an appropriate degree of accuracy.

(4 marks)

- Q11. Let  $Q = \frac{m^2}{n}$  where  $m$  is 3.43 correct to 2 decimal places and  $n$  is 10.427 correct to 3 decimal places.

By considering upper and lower bounds, find the value of  $Q$  to a suitable degree of accuracy. You must justify your answer.

(5 marks)

- Q12. A garden consists of a square of grass which contains a pond in the shape of a circle. The lawn has side length 12 feet to the nearest foot and the pond has diameter 5 ft to the nearest foot.

Work out a lower bound for the area of the garden which is grass.

(5 marks)