

Foundation GCSE: Rounding Errors & Bounds

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. A number x is rounded to the nearest integer to give 7. Write down the error interval for x .
2. A number y is rounded to the nearest 10 to give 50. Write down the error interval for y .
3. A number z is rounded to the nearest 100 to give 300. Write down the error interval for z .
4. A length L is measured to the nearest centimetre as 45 cm. Write down the lower bound of L .
5. A weight W is measured to the nearest kilogram as 80 kg. Write down the upper bound of W .
6. A number a is truncated to 1 decimal place as 3.4. Write down the error interval for a .
7. A number b is rounded to 2 decimal places as 5.18. Write down the error interval for b .
8. A number c is rounded to 1 significant figure as 400. Write down the error interval for c .
9. A number d is rounded to 2 significant figures as 0.035. Write down the upper bound for d .
10. A speed S is rounded to the nearest 10 km/h to give 70 km/h. Write down the error interval for S .
11. The length and width of a rectangle are given as 12 cm and 8 cm respectively, each correct to the nearest centimetre. Calculate the maximum possible perimeter.
12. A rectangle has a length of 15 cm and a width of 10 cm, both correct to the nearest centimetre. Calculate the lower bound for the area.
13. Two numbers are given as $x = 14.2$ correct to 1 decimal place and $y = 5.3$ correct to 1 decimal place. Calculate the upper bound for $x - y$.
14. A mass M is measured as 250 g correct to the nearest 10 g. Find the lower bound for $M \div 5$.
15. A car travels a distance of 180 miles, measured to the nearest 10 miles, in a time of 3 hours, measured to the nearest hour. Calculate the upper bound for the average speed.
16. Two numbers are given as $p = 6.4$ correct to 1 decimal place and $q = 2.1$ correct to 1 decimal place. Calculate the lower bound for the product $p \times q$.
17. A metal bar has a length of 240 cm correct to the nearest 10 cm. It is cut into smaller pieces each of length 15 cm correct to the nearest centimetre. Calculate the maximum possible number of full pieces that can be cut.
18. The side length of a square is 7.5 cm correct to 1 decimal place. Calculate the upper bound for the perimeter of the square.
19. A cylinder has a radius of 5 cm correct to the nearest centimetre and a height of 12 cm correct to the nearest centimetre. Calculate the lower bound for the volume of the cylinder.
20. The formula $v = u + at$ is used where $u = 12$ correct to the nearest whole number, $a = 4.5$ correct to 1 decimal place, and $t = 3.0$ correct to 1 decimal place. Calculate the upper bound for v .

Answers & Worked Solutions

1. $6.5 \leq x < 7.5$
 ± 0.5 from 7.
2. $45 \leq y < 55$
 ± 5 from 50.
3. $250 \leq z < 350$
 ± 50 from 300.
4. 44.5 cm
 $45 - 0.5 = 44.5$.
5. 84.5 kg
 $80 + 0.5 = 84.5$.
6. $3.4 \leq a < 3.5$
Truncation bounds.
7. $5.175 \leq b < 5.185$
 ± 0.005 from 5.18.
8. $350 \leq c < 450$
 ± 50 from 400.
9. 0.0355
Upper bound for 0.035.
10. $65 \leq S < 75$
 ± 5 from 70.
11. 42 cm
 $2 \times (12.5 + 8.5)$.
12. 133.25 cm^2
 14.5×9.5 .
13. 9.0
 $14.25 - 5.25$.
14. 49 g
 $245 \div 5$.
15. 74 mph
 $185 \div 2.5$.
16. 13.02
 6.35×2.05 .
17. 15 pieces
 $235 \div 15.5 = 15.16$.
18. 30.2 cm
 4×7.55 .
19. $225\pi \text{ cm}^3$
 $\pi \times 4.5^2 \times 11.5$.
20. 26.38
 $12.5 + (4.55 \times 3.05)$.