

# Rounding, Estimating, Scientific Notation

*Level 1 – 2*

1. Write the following using scientific notation.

- a) 375,000 .....
- b) 0.0032 .....
- c) 9,340,000 .....
- d) 0.00000407 .....
- e) Three thousandths .....
- f)  $24 \times 10^3$  .....
- g)  $380 \times 10^{-6}$  .....
- h) 3 million .....
- i) One hundredth .....
- j) 9.5 billion .....

2. Round each number to the given degree of accuracy.

- a) 1546 to 3 significant figures .....
- b) 1.09187 to 2 decimal places .....
- c) 0.0013876 to 2 significant figures .....
- d) 1.999 to 2 decimal places .....
- e) 1,234 to the nearest 10 .....
- f) 300289 to 4 significant figures .....
- g)  $6.736 \times 10^{-3}$  to 4 decimal places .....
- h) 0.0030245 to 3 significant figures .....

i) 1,870,263 to the nearest 100 .....

j)  $2.273654 \times 10^5$  to 4 significant figures .....

k)  $4.1005 \times 10^{-8}$  to 4 significant figures .....

l) 0.0000001952 to 2 significant figures .....

*Level 3 – 4*

3. Two cars have a one lap race. The winning car completes the lap 40 thousandths of a second faster than a rival. How many hundredths of a second is this?

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4. A grain of rice weighs approximately 20 milligrams (1000 milligrams = 1 gram). Approximately how many grains of rice are in a 1 kg bag? Write your answer in scientific notation.

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5. Perform the following calculations without using your calculator. Write your answers using scientific notation. Show each step of your working out.

a)  $(3 \times 10^4) \times (5 \times 10^6)$  .....

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b)  $(1.5 \times 10^{-3}) \times (8 \times 10^{-2})$  .....

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c)  $(3 \times 10^4) \times (9 \times 10^{-1})$  .....

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d)  $(2.5 \times 10^3) \div (5 \times 10^{-1})$  .....

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6. Light travels through space at approximately 300,000,000 m/s. Calculate how far light travels in one hour. Write your answer using scientific notation.

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*Level 5 – 6*

7. A book of 700 pages has a thickness of 6 cm. The cover has a thickness of 2 mm. Calculate the thickness of one page of the book in scientific notation. *Be careful, the cover goes all around the book.*

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8. Perform the following calculations without using your calculator. Write your answers using scientific notation. Show each step of your working out.

a)  $(2 \times 10^{96}) + (3 \times 10^{95})$  .....

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b)  $(3.2 \times 10^{-39}) + (8 \times 10^{-40})$  .....

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c)  $(5.4 \times 10^{87}) - (3.8 \times 10^{85})$  .....

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d)  $(1.4 \times 10^{-34}) - (3.8 \times 10^{-35})$  .....

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9. The length and width of a rectangular field, to 2 significant figures, are 130 m and 270 m respectively. Calculate the maximum and minimum possible area of the field. Write your answer in the form  $a \leq Area < b$ .

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*Level 7 – 8*

10. The length of one side of a square garden is measured. This number is then rounded to 3 significant figures. This value is then used to calculate the area. This calculated value is then rounded to 2 significant figures, giving a value of 100 m<sup>2</sup>. Calculate the maximum and minimum possible length of one side of the square garden. Write your answer in the form  $a \leq Length < b$ .

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11. Michael calculated the distance that he ran to be 1500 m, to 3 significant figures. The amount of time it took him was 600 seconds, to 2 significant figures. Calculate the maximum and minimum possible values for his average speed in m/s to 3 significant figures. Write your answer in the form  $a < \textit{Speed} < b$ .

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12. Consider question 3: if the faster car is travelling at an average speed of 200 km/h for the lap which is 5 km in length, what distance does 40 thousandths represent between the two cars? You may assume that both cars are travelling at their average speed near the end of the lap.

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