

Foundation GCSE: Estimating in Real Life

Name: _____

Class: _____

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

1. A contractor buys 41.2 kg of copper wire at 9.80 per kg, split across 1.9 identical projects. Estimate the cost per project by rounding each value to 1 significant figure.
2. Estimate the total cost of buying 7 kg of apples priced at 2.15 per kg by rounding numbers to 1 significant figure.
3. A rectangular living room measures 4.8 m by 3.1 m. Estimate its floor area by rounding measurements to 1 significant figure.
4. A metal sheet has an area of 48.5 cm^2 , and a square tile has a side length of 3.1 cm. Estimate the combined value of $\sqrt{48.5} + 3.1^2$ by rounding numbers.
5. A delivery van travels at an average speed of 48 mph for 2.9 hours. Estimate the total distance traveled.
6. Estimate the total cost of purchasing 4 items priced at 3.85, 12.40, 6.10, and 1.95 by rounding each price to the nearest pound.
7. A warehouse stores 398 crates, each weighing 21.5 kg, packed into transport containers holding 0.48 tonnes each. Estimate the number of containers required.
8. A standard bag of self-raising flour weighs 1.45 kg. Estimate the total mass of 12 such bags by rounding values.
9. A rectangular field has dimensions 7.8 km by 7.8 km with an adjacent section of 15.2 km^2 , divided by the square root of a regional park area of 101 km^2 . Estimate the resulting index $\frac{7.8^2 + 15.2}{\sqrt{101}}$.
10. A water storage tank holds 485 litres. If water leaks out at a steady rate of 21 litres per hour, estimate how many hours until the tank is empty.
11. A runner calculates race pacing by taking a total time of 59.4 minutes minus 11.2 minutes stationary rest, divided by 4.1 laps of 2.05 km each. Estimate the value of $\frac{59.4 - 11.2}{4.1 \times 2.05}$.
12. A local cinema auditorium has 28 rows with 32 seats in each row. Estimate the total seating capacity.
13. A chemical mixture requires 3.95 ml of catalyst multiplied by the square of the temperature difference $(10.2^\circ\text{C} - 2.9^\circ\text{C})^2$. Estimate the final yield value.
14. A standard return train ticket costs 47.50. Estimate the total cost for a group of 6 people traveling together.
15. A surveyor calculates land measurements using the formula $\frac{\sqrt{80.5} \times 9.9}{4.95}$. Estimate the resulting value.
16. A reference textbook has 312 pages, with each page containing an average of 28 lines of text. Estimate the total number of lines in the book.
17. A precious metal workshop uses 0.048 kg of gold alloy across 392 crafted rings, packaged in batches weighing 0.19 kg each. Estimate the total value or count represented by $\frac{0.048 \times 392}{0.19}$.
18. A cylindrical grain silo has a radius of 4.9 cm and a height of 10.2 cm on a model scale. Using $\pi \approx 3$, estimate its volume.
19. An engineering stress calculation uses the formula $\left(\frac{21.5}{4.8}\right)^2 + \sqrt{26}$. Estimate the resulting structural index.
20. A long-distance runner completes a 42.2 km marathon maintaining an average pace of 4.9 minutes per km. Estimate the total completion time in minutes.

Answers & Worked Solutions

1. $200 : \frac{40 \times 10}{2} = \frac{400}{2} = 200.$
2. $14 : 7 \times 2 = 14.$
3. $15 \text{ m}^2 : 5 \times 3 = 15.$
4. $16 : \sqrt{49} + 3^2 = 7 + 9 = 16.$
5. $150 \text{ miles} : 50 \times 3 = 150.$
6. $24 : 4 + 12 + 6 + 2 = 24.$
7. $16000 : \frac{400 \times 20}{0.5} = \frac{8000}{0.5} = 16000.$
8. $18 \text{ kg} : 1.5 \times 12 = 18.$
9. $7.9 : \frac{8^2 + 15}{\sqrt{100}} = \frac{64 + 15}{10} = 7.9.$
10. $25 \text{ hours} : 500 \div 20 = 25.$
11. $6 : \frac{60 - 10}{4 \times 2} = \frac{50}{8} = 6.25 \approx 6.$
12. $900 : 30 \times 30 = 900.$
13. $196 : 4 \times (10 - 3)^2 = 4 \times 49 = 196.$
14. $300 : 50 \times 6 = 300.$
15. $18 : \frac{\sqrt{81} \times 10}{5} = \frac{9 \times 10}{5} = 18.$
16. $9000 : 300 \times 30 = 9000.$
17. $100 : \frac{0.05 \times 400}{0.2} = \frac{20}{0.2} = 100.$
18. $750 \text{ cm}^3 : 3 \times 5^2 \times 10 = 3 \times 25 \times 10 = 750.$
19. $21 : \left(\frac{20}{5}\right)^2 + \sqrt{25} = 4^2 + 5 = 21.$
20. $200 \text{ minutes} : 40 \times 5 = 200.$