Exact answers versus approximations

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. A square has area $23\ \text{m}^2$. Write its exact positive side. [2 marks]

The positive number whose square is 23 is $\sqrt{23}$.

Answer: $\sqrt{23}$ m.

2. Round $\sqrt{23}$ to two decimal places. [2 marks]

$\sqrt{23} = 4.795831\ldots$; the third decimal rounds 4.79 to 4.80.

Answer: 4.80.

3. A circle has diameter 7 m. Give its exact circumference. [2 marks]

$C = \pi d = 7\pi$ m.

Answer: 7π m.

4. Round the circumference for diameter 7 m to one decimal place. [2 marks]

$7\pi = 21.991148\ldots$, giving 22.0 m.

Answer: 22.0 m.

5. A student uses 1.4 for $\sqrt{2}$ and obtains $10\sqrt{2} \approx 14$. Find the result to two decimal places without rounding early. [3 marks]

$10\sqrt{2} = 14.142135\ldots$.

Round the complete calculation, not the root alone.

Answer: 14.14.

6. For radius 50 cm compare $C = 100\pi$ with $100(3.14)$. How much smaller is the second value, to two decimal places? [3 marks]

$100\pi - 314 = 0.159265\ldots$ cm.

Answer: 0.16 cm smaller.