

1 Physical quantities and units – Part 2

—Answers

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1.1 (a) systematic (a zero error —every reading is 2 g too high).

(b) random (the readings scatter with no pattern).

1.2 (a) precise (close together).

(b) not accurate (far from the true value).

1.3 $\frac{0.5}{20.0} \times 100\% = 2.5\%$.

1.4 Multiplying $\rightarrow$ add the percentages: $2\% + 3\% = 5\%$.

1.5 $v_H = 12 \cos 60^\circ = 6.0 \text{ N}$; $v_V = 12 \sin 60^\circ = 10.4 \text{ N}$.

1.6 Volume $\propto \text{side}^3$. For a power, the percentage uncertainty is multiplied by that power, so the volume's uncertainty is $3 \times 1\% = 3\%$.