Calculations with sig digs

Your final answer cannot be any more precise than the measurements used in that calculation.

Adding | Subtracting

$$\begin{array}{rr} 122.5 & g \\ 0.351 & g \\ + \quad 42.38 & g \\ \hline 165.231 & \end{array}$$

↑ can only have 1 uncertain digit

Round the final answer to the least precise place value

$\doteq 165.2$ g

Multiplying | Dividing

$$\begin{array}{rrl} 23.2 & cm & (3sd) \\ \times \quad 1.2 & cm & (2sd) \\ \hline 464 & & \\ 232 & & \\ \hline 27.84 & & \end{array}$$

↑ one uncertain digit

Round the final answer to the least number of sig. digs used in the calculation.

$\doteq 28\ cm^2$ ← 2sd

Basic Skill Quiz

21. $\frac{2.674\ m}{2.0\ m} = 1.337$ (least s.d)

4 s.d. / 2 s.d.

$\doteq 1.3$

22. $5.25\ L \times 1.3\ L = 6.825\ L^2$ (least s.d)

3 s.d. × 2 s.d.

$\doteq 6.8\ L^2$

What if you had to round to the 100ths?

$\doteq 6.82\ L^2$ (rounded to even #)

23. $9.0\ cm + 7.66\ cm + 5.44\ cm$

(least precise place value)

$= 22.10\ cm$

$= 22.1\ cm$

24. $10.07\ g - 3.1\ g = 6.97\ g$

$\doteq 7.0\ g$

Working with Proportionalities

If you have a linear graph with a y-intercept of zero then this suggests a direct proportionality

$y \propto x \Rightarrow$ "y is directly proportional to x" $\propto$

"y varies directly with x"

Consider your "bounce that ball" data:

$h_b \propto h_d$ (proportionality statement)

$h_b = k h_d$ (general equation where k is the proportionality constant)

$35\text{cm} = k(60\text{cm})$

$k = \frac{35\text{cm}}{60\text{cm}}$

$k = 0.58$ ← proportionality constant.

$h_b = 0.58 h_d$ (specific equation)

$(y = mx + b)$