

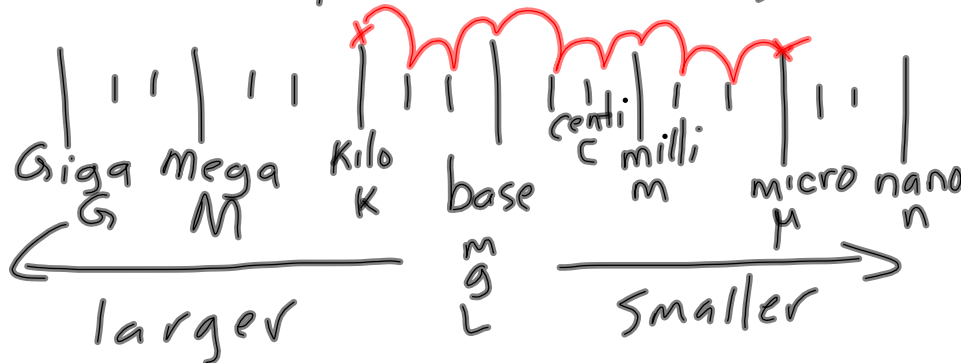
Skills Review

1) Metric Conversions

Base Unit (Symbol)	Quantity
metre (m)	distance
grams (g)	mass
seconds (s)	time
litre (L)	volume
metres cubed (m ³)	"

Standard units

MKS system → m, kg, s



$$\underline{0.000016000} \mu\text{m} = 0.000016 \text{ Km}$$

$$\underline{0.0015} \text{ cm}^2 = 0.0015 \text{ m}^2$$

$$1 \text{ cm} = 0.01 \text{ m}$$

$$A = (0.15)(0.01) = 0.0015 \text{ m}^2$$

$$18 \times 1 = 18$$

$$18 \times \frac{6}{6} = 18$$

$$18 \times \frac{\frac{1}{2}}{\frac{1}{4}} = 18$$

$$15 \text{ years} \times \frac{365 \text{ days}}{1 \text{ year}} = 5475 \text{ days}$$

$$1.25 \frac{\text{C\$}}{\text{L}} = \frac{\text{US\$}}{\text{gallon}}$$

$$1 \text{ C\$} = 0.91 \text{ US\$}$$

$$3.8 \text{ L} = 1 \text{ gallon}$$

$$1.25 \frac{\cancel{\text{C\$}}}{\cancel{\text{L}}} \times \frac{3.8 \cancel{\text{L}}}{1 \text{ gallons}} \times \frac{0.91 \text{ US\$}}{1 \cancel{\text{C\$}}}$$

$$= \frac{1.25 \times 3.8 \times 0.91}{1 \times 1} \frac{\text{US\$}}{\text{gallon}}$$

$$= 4.32 \frac{\text{US\$}}{\text{gallon}}$$

23

$$(2.4 \times 10^{100}) \times (4 \times 10^{90})$$

$$= (2.4 \times 4) \times 10^{100+90}$$

$$= 9.6 \times 10^{190}$$

$$30 \quad \frac{(1.53 \times 10^{50}) + (9 \times 10^{48})}{3 \times 10^{30}}$$

$\begin{array}{c} \div 100 \\ \downarrow \\ 3 \times 10^{30} \end{array}$
 $\begin{array}{c} \times 100 \\ \downarrow \\ 9 \times 10^{48} \end{array}$

$$= \frac{(1.53 \times 10^{50}) + (0.09 \times 10^{50})}{3 \times 10^{30}}$$

$$= \frac{(1.53 + 0.09) \times 10^{50}}{3 \times 10^{30}}$$

$$= \frac{1.62 \times 10^{50}}{3 \times 10^{30}}$$

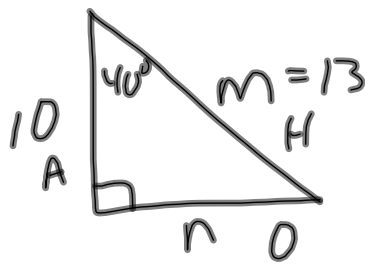
$$= \frac{1.62}{3} \times 10^{50-30}$$

$$= 0.54 \times 10^{20}$$

$$= 5.4 \times 10^{19}$$

$$38. \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

39.

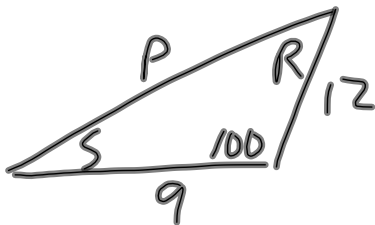


$$\cos 40 = \frac{10}{m}$$

$$m = \frac{10}{\cos 40} = 13$$

$$\tan 40 = \frac{n}{10}$$

$$n = 10 \tan 40 = 8.39$$



$$p^2 = 9^2 + 12^2 - 2(9)(12) \cos 100$$

$$= 81 + 144 + 37.5$$

$$= 262.5$$

$$\frac{16.2}{\sin 100} = \frac{12}{\sin S} = \frac{9}{\sin R}$$

$$p = 16.2$$

$$\sin S = \frac{(\sin 100)(12)}{16.2}$$

$$\sin S = 0.729$$

$$S = 47^\circ \text{ or } \cancel{133^\circ}$$

$$\sin R = \frac{9 \sin 100}{16.2}$$

$$R = 33^\circ$$

Significant Digits

A digit is significant if ...

→ it is non-zero

→ any zeros between sig. dig.

→ any trailing zeros after the decimal

$\begin{array}{c} 900 \\ \quad ?? \\ \hline 1 \text{ s.d.} \end{array}$	$\begin{array}{c} 0.900 \\ \hline 3 \text{ s.d.} \end{array}$
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x and ÷

Answer has same # of sig. dig.
as the given value with the least
sig. dig.

$\begin{array}{r} 943 \\ \times 16 \\ \hline 15088 \\ \hline 15000 \end{array}$	$\begin{array}{r} 943.5 \\ \times 16.5 \\ \hline 15567.75 \\ \hline 15500 \end{array}$	$\begin{array}{r} 942.5 \\ \times 15.5 \\ \hline 14608.75 \\ \hline 14500 \end{array}$
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+ and -

The digit that has the least precise decimal place is the limiting factor.
The final answer can have no more precise decimal place than this.

Example:
$$\begin{array}{r} 345.7 \\ 633 \\ + 123.45 \\ \hline 1102.15 \end{array}$$

Since you don't know the tenth place in the middle number, you cannot know the tenth place in the final answer, which you must round to 1102