

Decimal Rule

no decimal = exact
(infinite ∞)

(#5-3)

General SigFigs I

In the following questions give the correct answer using significant digits.
Indicate number of significant digits.

| | | | |
|----------------------|----------------------|---|------------------------|
| 1. 55. <u>2</u> | 2. 250. <u>2</u> | 3. 250 <u>2 or ∞</u> | 4. 2.5E2 <u>2</u> |
| 5. 125.000 <u>6</u> | 6. 0.000625 <u>3</u> | 7. 100 people <u>1 or ∞</u> | 8. 100 meters <u>1</u> |
| 9. .0025000 <u>5</u> | 10. 0.01 <u>1</u> | 11. 5000.0001 <u>8</u> | 12. 53 <u>2</u> |

9. 250 liters of water + 0.005 L of water =

measurement not ∞

$$\begin{array}{r} 250 \\ + 0.005 \\ \hline 250.005 \end{array} \Rightarrow \boxed{250 \text{ Liters (2 sig figs)}}$$

10. 25.00 + 0.005 =

$$\begin{array}{r} 25.00 \\ + 0.005 \\ \hline 25.005 \end{array} \Rightarrow \boxed{25.01}$$

11. 25.00 - 0.005 =

$$\begin{array}{r} 25.00 \\ - 0.005 \\ \hline 24.995 \end{array} \Rightarrow \boxed{25.00}$$

* 12. 135 old people + 100 young people =

estimate \uparrow

$$\begin{array}{r} 135 \\ + 100 \\ \hline 235 \end{array} \Rightarrow \boxed{200 \text{ people (1 sig fig)}}$$

13. 150.00 * 12.0 =

$$5 \quad (3) \quad \begin{array}{r} 150.00 \\ \times 12.0 \\ \hline 1800 \end{array} \Rightarrow \boxed{1.80 \text{ E}3}$$

3 sig figs

14. 2000.0 / 10 =

$$5 \quad (1) \quad \begin{array}{r} 2000.0 \\ \div 10 \\ \hline 200 \end{array} \Rightarrow \boxed{2 \text{ E}2}$$

1 sig fig

15. 25 people / 5.00 =

$$(2) \quad 3 \quad \begin{array}{r} 25 \\ \div 5.00 \\ \hline 5.0 \end{array} \Rightarrow \boxed{5.0}$$

2 sig figs

16. 1.0E5 * 23.0 =

$$(2) \quad 3 \quad \begin{array}{r} 1.0 \text{ E}5 \\ \times 23.0 \\ \hline 230,000 \end{array} \Rightarrow \boxed{2.3 \text{ E}6}$$

2 sig figs

▼ 17. 150.0 / 6 = 25

$$4 \quad (1) \quad \begin{array}{r} 150.0 \\ \div 6 \\ \hline 25 \end{array} \Rightarrow \boxed{25}$$

1 sig fig

Decimal Rule

$150.0 / 6 = 25.00$

18. 950.0 / 1.5E2 =

$$4 \quad (2) \quad \begin{array}{r} 950.0 \\ \div 1.5 \text{ E}2 \\ \hline 6.33 \end{array} \Rightarrow \boxed{6.3}$$

2 sig figs

19. 100.0 / 3.00 =

$$4 \quad (3) \quad \begin{array}{r} 100.0 \\ \div 3.00 \\ \hline 33.3 \end{array} \Rightarrow \boxed{33.3}$$

3 sig figs

(#5-3)
General SIGFIGS II
CHEMISTRY

if it looks like an estimate - it probably is.

Determine the number of significant digits

| | | | |
|-----------------------------|---------------|------------------|--------------------|
| 1. 1.6990×10^5 (5) | 2. 0.0056 (2) | 3. 120 frogs (3) | 4. 120. (2) |
| 5. .0050080 (5) | 6. 12500. (3) | 7. 12500 (3) | 8. 200 (1) |
| 9. 200. (1) | 10. 200 m (1) | 11. 200. m (1) | 12. 200 people (1) |

13. $12.00 + 25.4444 =$

$$\begin{array}{r} 12.00 \\ + 25.4444 \\ \hline 37.4444 \end{array}$$

37.44
4 sig fig

14. $1.40 \times 10^2 + 144. =$

$$\begin{array}{r} 140 \\ + 144 \\ \hline 284 \end{array}$$

284 3 sig fig

15. $1.4 \times 10^2 + 144. =$

$$\begin{array}{r} 140 \\ + 144 \\ \hline 284 \end{array}$$

280 2 sig fig

16. $.0502 + 22.3 =$

$$\begin{array}{r} 0.0502 \\ + 22.3 \\ \hline 22.3502 \end{array}$$

224 3 sig fig

17. $25. / 4.00 =$

$$\begin{array}{r} 25. \\ \hline 4.00 \end{array}$$

6.25 = 6.3 2 sig fig

18. $15 * 6 = 90$

90 1 sig fig

19. $1.5000 \text{ E}2 * .0000002 =$

$$\begin{array}{r} 1.5000 \\ \times .0000002 \\ \hline 0.00003 \end{array}$$

750,000,000 → round → 3.E-5 1 sig fig

20. $1.50000000 \text{ E}1 * 11. =$

$$\begin{array}{r} 1.50000000 \\ \times 11. \\ \hline 16.5 \end{array}$$

165 → round → 170

Decimal Rule
 No decimal (not integers) could be exact

(#5-3)
 General SigFigs III

| | | | |
|------------------------|--------------------------------|-------------------------------------|-------------------------------|
| 1. <u>.000050</u> 2 | 2. <u>150.</u> 2 (estimate) | 3. <u>150 apples</u> 2 or ∞ | 4. <u>150.</u> 2 |
| 5. <u>15087.</u> 5 | 6. <u>25.</u> 2 | 7. <u>1.5 × 10²</u> 2 | 8. <u>25 people</u> 2 or ∞ |
| 9. <u>0.005</u> 1 | 10. <u>123.456</u> 6 | 11. <u>0.0500</u> 2 | 12. <u>10.01</u> 4 |

Addition/Subtraction

13. $100.0 + 25.55555 =$

$$\begin{array}{r} 100.0 \\ + 25.55555 \\ \hline 125.55555 \\ \text{round} \end{array}$$
 (13) 125.6

14. $3.0 \times 10^4 + 5. =$

15. $260. - 2.60 \times 10^3 =$

$$\begin{array}{r} 30000 \\ + 5 \\ \hline 30005 \\ \text{round} \end{array}$$
 (14) $30,000$

Multiplication/Division

16. $= 100.0 / .3 =$

$$\begin{array}{r} 100.0 \\ \times 10 \\ \hline 1000 \\ \times 3 \\ \hline 2600 \\ - 2600 \\ \hline 2340 \\ \text{round} \end{array}$$
 (15) $2,340$

17. $.00005 * 1000. =$

18. $250. / .00504 =$
 2 3 (2)

(16) 333.3
 round to 1 → 300

(17) $5E-2$ or 0.05
 1 sig fig

18 $49603. \rightarrow 50000$ or $5.0E4$
 round to 2 s.f

(#5-3)
Chemistry
Sigfig general IV

add or subtract
line up
and answer.
Use last "known"
place on
both

1. $135.0 + 0.05 =$

$$\begin{array}{r} 135.0 \\ + 0.05 \\ \hline 135.05 \end{array} \rightarrow \boxed{135.1}$$

round 3 sf.

2. $1.003 + 25. + 27.0 =$

$$\begin{array}{r} 1.003 \\ + 25. \\ + 27.0 \\ \hline 53.003 \end{array} \rightarrow \boxed{53}$$

round 2 sf.

3. $1.04 - 1000. =$

$$\begin{array}{r} 1.04 \\ - 1000. \\ \hline -998.96 \end{array}$$

4. $1.5 \times 10^3 - 0.0003 =$

$$\begin{array}{r} 1500 \\ - 0.0003 \\ \hline 1499.9997 \end{array} \rightarrow \boxed{1.5 \times 10^3}$$

round 2 sf.

5. $2.5 \times 10^{-2} + 2.20 \times 10^{-1} =$

$$\begin{array}{r} 0.025 \\ + 0.220 \\ \hline 0.245 \end{array} \rightarrow \boxed{0.245}$$

6. $25. \times 0.00002 =$

$$\begin{array}{r} 25. \\ \times 0.00002 \\ \hline 0.0005 \end{array}$$

least 1 sig fig

7. $2000. \times 25. =$

$$\begin{array}{r} 2000. \\ \times 25. \\ \hline 50000 \end{array} \rightarrow \boxed{5 \times 10^4}$$

least 1 sig fig

8. $.0002 / .0002 =$

$$\begin{array}{r} .0002 \\ \div .0002 \\ \hline 1 \end{array}$$

1 sig fig

9. $1.5 \times 10^3 / 1.5 \times 10^{-2} =$

$$\begin{array}{r} 1.5 \times 10^3 \\ \div 1.5 \times 10^{-2} \\ \hline 225 \end{array} \rightarrow \boxed{23}$$

2 sig figs

10. $3.0 \times 10^3 \times 3.0 \times 10^{-3} =$

$$\begin{array}{r} 3.0 \times 10^3 \\ \times 3.0 \times 10^{-3} \\ \hline 9.0 \end{array}$$

2 sig figs

mult/divide
determine
sig figs in
the question
for both.
- determine
answer &
round to the
least amount
of sig figs
in question.