# Significant Figures

1. How many significant figures are there in each of the following measurements?

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a) | 23 cm | **2** | h) | 0.238 km | **3** | o) | 350 000 cm | **2** |
| b) | 1.498 g | **4** | i) | 8.0335 cm | **5** | p) | 180.00 s | **5** |
| c) | 248.3 s | **4** | j) | 0.055 87 m | **4** | q) | $3.50 \cdot 10^3$ cm | **3** |
| d) | 9.855 mL | **4** | k) | 307 g | **3** | r) | $1.604 \cdot 10^4$ m | **4** |
| e) | 76.414 kg | **5** | l) | 1.400 82 cm | **6** | s) | 14.380 s | **5** |
| f) | 32.8 m | **3** | m) | 0.000 589 00 g | **5** | t) | 0.0804 s | **3** |
| g) | 107 mm | **3** | n) | 4500 km | **2** | u) | 3.450 00 m | **6** |

2. Express the answer to each of the following calculations with the correct numbers of significant figures.

| | | | | | |
|---|---|---|---|---|---|
| a) | 1.2 cm x 1.3 cm | = | 1.56 | = | **1.6 $cm^2$** |
| b) | 2.1 m x 1.8 m | = | 3.78 | = | **3.8 $m^2$** |
| c) | 1.45 m x 2.2 m | = | 3.19 | = | **3.2 $m^2$** |
| d) | 2.5 mm x 1.33 mm | = | 3.325 | = | **3.3 $mm^2$** |
| e) | 4.3324 km x 1.2 km | = | 5.198 88 | = | **5.2 $km^2$** |
| **f)** | 3.0 cm x 4.000 cm | = | 12 | = | **12 $cm^2$** |
| g) | 2.005 cm x 5.0 cm | = | 10.025 | = | **10. $cm^2$ or $1.0 \cdot 10^1$** |
| h) | 400 m x 87 488 m | = | 34 995 200 | = | **30 000 000 $m^2$ or $3 \cdot 10^7$ $m^2$** |
| i) | $2.3 \cdot 10^6$ m x $1.45 \cdot 10^2$ m | = | $3.335 \cdot 10^8$ | = | **$3.3 \cdot 10^8$ $m^2$** |
| j) | $8.71 \cdot 10^2$ mm x $1.0 \cdot 10^2$ mm | = | 87 100 | = | **87 000 $mm^2$ or $8.7 \cdot 10^4$ $mm^2$** |
| k) | 32.88 $m^2$ ÷ 4.388 m | = | 7.493 163 172 | = | **7.493 m** |
| l) | 16.5 $km^2$ ÷ 1.8 km | = | 9.166 666 667 | = | **9.2 km** |
| m) | 84.99 $m^2$ ÷ 2.63 m | = | 32.31558935 | = | **32.3 m** |
| n) | 9.9 $mm^2$ ÷ 3.4484 mm | = | 2.870896648 | = | **2.9 mm** |
| o) | 3.085 $cm^2$ ÷ 2.774 48 cm | = | 1.111620072 | = | **1.112 cm** |
| p) | 0.0045 $mm^2$ ÷ 0.90 mm | = | 0.005 | = | **0.0050 mm** |
| q) | 120 $km^2$ ÷ 8.56 km | = | 14.01869159 | = | **14 km** |
| r) | 0.7600 $mm^3$ ÷ 1.50 mm | = | 0.5066666667 | = | **0.507 $mm^2$** |
| s) | $4.80 \cdot 10^5$ $m^2$ ÷ $8.5 \cdot 10^3$ m | = | 56.47058824 | = | **56 m** |
| t) | $6.30 \cdot 10^0$ $m^3$ ÷ 0.0804 m | = | 78.35820896 | = | **78.4 $m^2$** |
| u) | 3.4500 $cm^2$ ÷ 450 cm | = | 0.0076666667 | = | **0.0077 cm** |

3. Express the answer to each of the following calculations with the correct number of significant figures.

a) 3.42 cm + 8.13 cm = 11.55 = **11.55 cm**

b) 4.939 g + 3.822 g = 8.761 = **8.761 cm**

c) 17.8 cm + 12.11 cm = 29.11 = **29.1 cm**

d) 4.552 kg + 3.14 kg = 7.692 = **7.69 kg**

e) 1.966 s + 3.4422 s = 5.4082 = **5.408 s**

f) 80 cm + 13.0 cm = 93 = **90 cm**

g) 72.60 m + 0.0950 m = 72.695 = **72.70 m**

h) 13.89 cm + 6.8932 cm = 20.7832 = **20.78 cm**

i) $1.30 \cdot 10^2$ cm + $2.4 \cdot 10^4$ cm = 24 130 = **24 000 cm**

j) $8.19 \cdot 10^3$ m + $1.400 \cdot 10^4$ m = 22 190 = **22 190 m**

k) 3.882 g – 2.114 g = 1.768 = **1.768 g**

l) 4.894 cm – 2.33 cm = 2.564 = **2.56 cm**

m) 15.6674 m – 12.838 m = 2.8294 = **2.829 m**

n) 11.22 g – 8.8 g = 2.42 = **2.4 g**

o) 133 L – 6.45 L = 126.55 = **127 L**

p) 750 cm – 677.4 cm = 72.6 = **70 cm**

q) 10 000 m – 94 m = 9906 = **10 000 m**

r) 0.0890 cm – 0.0666 cm = 0.0224 = **0.0224 cm**

s) $0.340 \cdot 10^1$ g – $1.20 \cdot 10^2$ g = -116.6 = **–117 g**

t) $4.5 \cdot 10^5$ km – $3.10 \cdot 10^3$ km = 446 900 = **450 000 km**