CHE152
Significant Figures Key

2. How many significant figures are in each of the following?

(a) 1.0000	5
(b) 1.1101	5
(c) 100.000	6
(d) 0.00120	3
(e) 0.0001001	4
(f) 15,000	2 or 3 or 4 or 5 (uncertain)
(g) 5.60×10^5	3
(h) 9	1
(i) 1.0000×10^2	5
(j) 5.60	3

3. Calculate the following to the correct number of significant figures.

(a) 0.3201 + 100.0212	100.0532
(b) 0.03201 + 100.0212 + 9	109
(c) 100.0212 - 0.03201	99.9892
(d) 9 - 0.03201	9
(e) 5.1 x 6.80 x 51.32	1.8×10^3
(f) 6.821/9.83215	0.6937
(g) (5.1 x 6.80)/3	1×10^1 (11.56)

(h) $\dfrac{(5.1 \times 10.63) + 100.1}{(6.32 \times 8.9) - 4} =$ 3.0

(i) $\dfrac{(1.01 \times 10^2 \times 6.9 \times 10^4) + (8.32 \times 5)}{(\log(6.32)) - (4.32 + 100.1)} =$ -6.7×10^4

(j) $6.3^x = 1.8 \times 10^{-2}$ (find x) -2.2

(k) $x = 1.23 \times 10^{-101}$ (find x) 7×10^{-21}

(l) $\dfrac{104.0 \text{ in} + [3.02 \text{ ft} \cdot (12 \text{ in} / 1 \text{ ft})]}{1.20 \text{ min} - [0.002 \text{ hr} \cdot (60 \text{ min} / 1 \text{ hr})]} =$ 1.3×10^2 in/min

(m) $(5.632 \times 10^5)^{1/9} = x$ (find x) 4.355

3.

(a)
```
     0.0320 1
   100.0212
-------------
100.0532 1 = 100.0532
```

(b)
```
     0.03201
   100.0212
     9
-------------
109.05321 = 109
```

(c)
```
   100.0212
     0.03201
-------------
99.9891 9 = 99.9892
```

(d)
```
     9
   0.03201
-------------
 8.96799 = 9
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(h) $$\frac{(5.1 \times 10.63) + 100.1}{(6.32 \times 8.9) - 4} = \frac{54._{21} + 100.1}{56._{25} - 4} = \frac{100._{31}}{52._{25}} = 2.9_5 = 3.0$$

(i)
$$\frac{(1.01 \times 10^2 \times 6.9 \times 10^4) + (8.32 \times 5)}{(\log(6.32)) - (4.32 + 100.1)} = \frac{6.9_{69} \times 10^6 + 4._{16} \times 10^1}{0.800_7 - 104.4_2} =$$

$$\frac{6.9_{690416} \times 10^6}{-103.6_{193}} = -6.7 \times 10^4$$

(j) $6.3^x = 1.8 \times 10^{-2}$

$\log(6.3^x) = \log(1.8 \times 10^{-2})$

$x \log(6.3) = \log(1.8 \times 10^{-2})$

$x(0.79_9) = -1.74_4$

$x = -2.2$

(k) $x^5 = 1.23 \times 10^{-101}$

$\log(x^5) = \log(1.23 \times 10^{-101})$

$\log(x^5) = \log(1.23) + \log(10^{-101})$

$5 \log(x) = \log(1.23) - 101 \log(10)$

$5 \log(x) = 0.0899 - 101$

$5 \log(x) = -100._{91}$

$\log(x) = -20.1_{82}$

$\text{antilog}[\log(x)] = \text{antilog}(-20.1_{82})$

$x = 6._{58} \times 10^{-21} = 7 \times 10^{-21}$

(l)

$$\frac{1.04 \text{ in} + [3.02 \text{ ft} \cdot (12 \text{ in} / 1 \text{ ft})]}{1.20 \text{ min} - [0.002 \text{ hr} \cdot (60 \text{ min} / 1 \text{ hr})]} = \frac{104.0 \text{ in} + 36.2_4 \text{ in}}{1.20 \text{ min} - 0.1_2 \text{ min}} =$$

$$\frac{140.2_4 \text{ in}}{1.0_8 \text{ min}} = 1.3 \times 10^2 \ \frac{\text{in}}{\text{min}}$$

(m) $(5.632 \times 10^5)^{1/9} = x$

$\log[(5.632 \times 10^5)^{1/9}] = \log(x)$

$1/9 \log[(5.632 \times 10^5)] = \log(x)$

$1/9(5.7507) = \log(x)$

$0.63896 = \log(x)$

$\text{antilog}(0.63896) = \text{antilog}[\log(x)]$

$x = 4.354_7 = 4.355$