Scientific Notation & Sig Figs

1. Complete this series of exponents ...

Decimal Value	Fractional Value	Exponential Value
1,000	1,000/1	10^3
100	100/1	10^2
10	10/1	10^1
1	1/1	10^0
0.1	1/10	10^{-1}
0.01	1/100	10^{-2}
0.001	1/1000	10^{-3}

2. Rewrite each number below in scientific notation ...

110 = 1.1×10^2

12,000 = 1.2×10^4

5,280 = 5.28×10^3

254,000 = 2.54×10^5

1.2 = 1.2×10^0

454 = 4.54×10^2

15,000,000 = 1.5×10^7

0.025 = 2.5×10^{-2}

0.12 = 1.2×10^{-1}

0.000 12 = 1.2×10^{-4}

0.000 001 = $1. \times 10^{-6}$

0.002 = $2. \times 10^{-3}$

0.000 000 8 = $8. \times 10^{-7}$

0.05 = $5. \times 10^{-2}$

3. Rewrite each number below in decimal notation ...

1.25×10^2 = 125

5.65×10^5 = 565,000

3.9×10^1 = 39

9.2×10^4 = 92000

8.33×10^{10} = 833,000,000,000

4.6×10^0 = 4.6

2.8×10^3 = 2800

3.5×10^{-2} = .035

9.4×10^{-5} = .000094

7.44×10^{-1} = .744

8.5×10^{-7} = .00000085

2.7×10^{-3} = .0027

5.55×10^{-9} = .000000000555

1.1×10^0 = 1.1

4. Scientific Notation and Sig Figs …

How many sig. figs are in each number below?

0.0120	1,000	100.0	105.0	1000.001
3	1	4	4	7

Scientific notation and decimal notation are two different ways to represent the same number. Therefore, when converting between the two styles of notation each number must have the same number of sig figs. Check these equivalences below …

$125 = 1.25 \times 10^{2}$	$0.0125 = 1.25 \times 10^{-2}$
$1{,}250 = 1.25 \times 10^{3}$	$0.01250 =$ 1.250×10^{-2}
$1{,}250. = 1.250 \times 10^{3}$	$1.025 \times 10^{3} = 1{,}025$ or $1{,}025.$
$1{,}250.0 = 1.2500 \times 10^{3}$	$1.025 \times 10^{4} = 10{,}250$
$10{,}250 =$ 1.025×10^{4}	$1.0250 \times 10^{4} =$ $10250.$
$0.125 = 1.25 \times 10^{-1}$	$1.02500 \times 10^{4} =$ 10250.0

Rewrite each number below in the opposite notation. As you do, observe the rules for significant figures!

i.e. both ways should have the SAME S.F.

$340 =$ 3.4×10^{2}	$6.500 \times 10^{3} =$ $6500.$
$680. =$ 6.80×10^{2}	$9.430 \times 10^{2} =$ 943.0
$0.0125 =$ 1.25×10^{-2}	$93{,}000{,}000 =$ 9.3×10^{7}
$0.10 =$ 1.0×10^{-1}	$5280. =$ 5.280×10^{3}
$0.0250 =$ 2.50×10^{-2}	$10 =$ 1×10^{1}
$3.4 \times 10^{3} =$ 3400	$0.01 =$ 1×10^{-2}
$8.30 \times 10^{2} =$ 830	$0.040 =$ 4.0×10^{-2}
$3.10 \times 10^{-2} =$ $.0310$	$2.3 \times 10^{5} =$ 230000
$10{,}000 =$ 1×10^{4}	$4.5000 \times 10^{2} =$ 450.00
$100.1 =$ 1.001×10^{2}	$6.1 \times 10^{3} =$ 6100
$3.00 \times 10^{1} =$ 30.0	$9.60 \times 10^{-4} =$ $.000960$
$8.1001 \times 10^{2} =$ 810.01	$5{,}050 =$ 5.05×10^{3}