

 10^{21} 10^5

Section 2.2

 350 10^0

Powers of Ten and the Zero Exponent



Avogadro's number = 6.0221415×10^{23}



The speed of light = $2.99\ 792\ 458 \times 10^8$ m / s



Temperature of the Sun's Core = 1.5×10^6 °C



since 15000000 kelvin = 14999726.85 degree Celsius

Distance related to Powers of 10

<http://vimeo.com/819138>



| Number in Words | Standard Form | Power |
|----------------------|---------------|--------|
| One billion | 1 000 000 000 | 10^9 |
| One hundred million | 100 000 000 | 10^8 |
| Ten million | 10 000 000 | 10^7 |
| One million | 1 000 000 | 10^6 |
| One hundred thousand | 100 000 | 10^5 |
| Ten thousand | 10 000 | 10^4 |
| One thousand | 1 000 | 10^3 |
| One hundred | 100 | 10^2 |
| Ten | 10 | 10^1 |
| One | 1 | 10^0 |

*Image taken from "Math Makes Sense 9", page 59, copyright to pearson education Canada

Any number (except 0) with an exponent 0 will equal 1

$$2^0 = 1$$

$$13^0 = 1$$

$$199^0 = 1$$

$$(-6)^0 = 1$$

Why???



Zero Exponent LAW

A power with an interger base, not including 0, and an exponent of 0 is equal to 1



Try this

Evaluate each expression



$$(1258.783)^0$$

$$(-6)^0 = 1$$

a) 5^0

b) $-(5)^0$

c) $(-5)^0$

d) -5^0

1

$$\begin{aligned} &(-1) \times 5^0 \\ &-1 \times 1 \end{aligned}$$

1

$$\begin{aligned} &-1 \\ &(-1)^0 \end{aligned}$$

Writing Numbers Using Powers of Ten

A place value chart may help



Write 96 713 as a power of 10

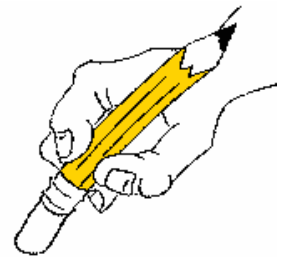
| Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---------------|-----------|----------|------|------|
| | | | | |

Erase to see solutions

$$96\,713 =$$

$$= (90\,000 + 6\,000 + 700 + 10 + 3)$$

$$= 96\,713$$



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PRACTICE TIME

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4(a, b)

5(a, b, c, d)

#6(a, c, e)

#8(a, c, e)

#9(a, c, e)

#10 all

#11

#13