**Order of Big-O Functions**

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| *Type* | *Function* | *Useful Facts* |
| Logarithmic | log n | log2(n) > log3(n) > log4(n) |
| Poly Logarithmic | (log n)a | (log n)2 < (log n)3 < (log n)4 |
| Fractional Power | na *where a (0..1)* | n0.2, |
| Linear | n | 2n, |
| Linear Logarithmic (*n log n*) | n log(n) | 5n log n |
| Polynomial | nb *where b > 1* | n2, n3 |
| Exponential | an | 2n, 3n+1 |
| Linear Exponential | nn | n2n |
|  |  |  |

**Math Facts**

*Exponents*

|  |  |
| --- | --- |
| ***Rule*** | ***Explanation*** |
|  | Same base? Can add exponents. |
|  | Same exponent? Can multiply base. |

*Logs*

|  |  |
| --- | --- |
| ***Rule*** | ***Explanation*** |
|  | For a base b > 1 and *any* exponent a > 0, this inequality holds for large enough *n*  *E.g.* or |
|  |  |
|  | The smaller the base, the larger the log. The difference between log bases is just a *constant* |
|  | Quotient rule. |