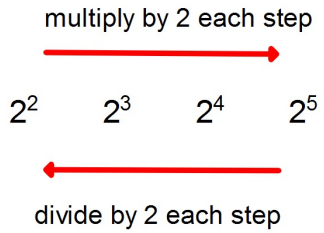
Simplify each. Write decimal answers as fractions.

2^5	32
2^4	16
2^3	8
2^2	4
2^1	2
2^0	1
2^{-1}	$\frac{1}{2}$
2^{-2}	$\frac{1}{4}$
2^{-3}	$\frac{1}{8}$



1 as an exponent:

For every number a,

a^1 = a

Any number raised to the first power = itself

If there is no exponent on a number it is assumed to be 1

If the exponent on a base is 1 you don't need to write it.

Zero as an Exponent:

For every nonzero number a,

a^0 = 1

Any number (except 0), raised to the zero power = 1

Why isn't $0^0 = 1$?

$0^3 = 0$
$0^2 = 0$
$0^1 = 0$ ...

by this pattern
it appears that
0^0 should be 0

$3^0 = 1$
$2^0 = 1$
$1^0 = 1$...

by this pattern
it appears that
$0^0 = 1$

Since 0^0 can't be both 0 and 1
0^0 is undefined.

Negative Exponents:

For every nonzero number a,

$a^{-n} = \frac{1}{a^n}$

Negative exponents represent Reciprocals

Simplify each. Write your answer without zero as an exponent or negative exponents.

1. $5a^{-2}$

$= \frac{5}{a^2}$

2. $\frac{4}{e^{-3}}$

$= 4e^3$

3. $7Q^{-5}R^0$

$= \frac{7}{Q^5}$