Algebra 1 7.2

Use the properties of exponents to divide monomials

Simplify expressions containing negative exponents

Simplify expressions containing zero exponents

Compare measurements using order of magnitude

$\frac{2^7}{2^4}$

$\frac{t^4}{t^3}$

exponent

base

quotient

factors

negative exponent

order of magnitude

move me

Whiteboards

Triangle puzzle (if time)

Whiteboards

GuidedPractice

Simplify each expression. ~~Assume that no denominator equals zero~~.

4A. $\frac{v^{-3}wx^2}{wy^{-6}}$

4B. $\frac{32a^{8}b^{3}c^{4}}{4a^{3}b^{5}c^{2}}$

4C. $\frac{5j^{-3}k^{2}m^{-6}}{25k^{-4}m^{-2}}$

$\frac{8}{a^{11}b^{2}c^{2}} = 8\,\frac{1}{a^{11}b^{2}c^{2}}$

simplify numbers
combine bases
relocate if necessary

Triangle puzzle

10 100 one O.O.M.

How many decimal places are they different by?

100 10,000 two O.O.M.

1 1,000,000

10 1000

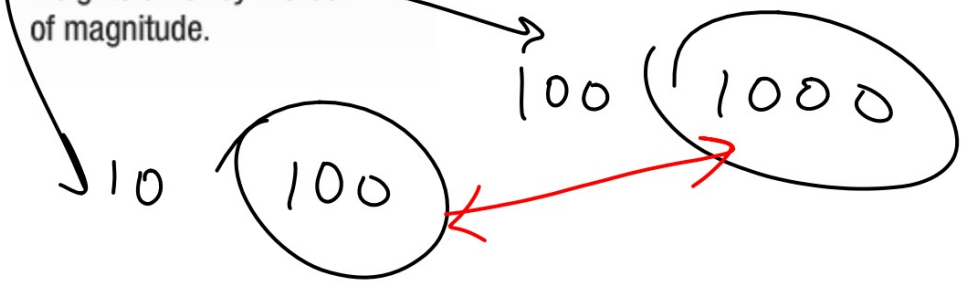
Orders of magnitude

↑ powers of 10

Real-World Link

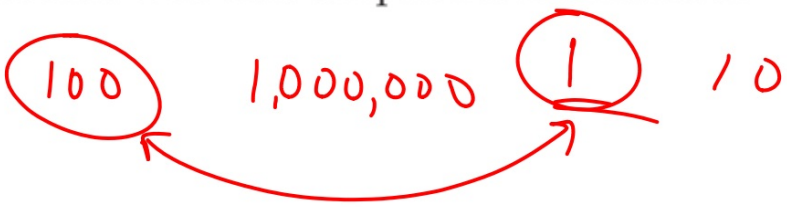
An adult human weighs about 70 kilograms and an adult dairy cow weighs about 700 kilograms. Their weights differ by 1 order of magnitude.

Order of magnitude...nearest power of 10
related to scientific notation (sort of...)
Round to the nearest power of 10
10, 100, 1000, etc.
How many decimal places are they different by?



Round to nearest power of 10, how many decimal places are they different by?

43. INTERNET In a recent year, there were approximately 3.95 million Internet hosts. Suppose there were 208 million Internet users. Determine the order of magnitude for the Internet hosts and Internet users. Using the orders of magnitude, how many Internet users were there compared to Internet hosts?



1
10
100
1000
10000

GuidedPractice

How many decimal places are they different by?

5. ASTRONOMY The order of magnitude of the mass of Earth is about 10^{27}. The order of magnitude of the Milky Way galaxy is about 10^{44}. How many orders of magnitude as big is the Milky Way galaxy as Earth?

10^{27} 1×10^{44}

1
10
100
1000

17

57. CCSS **SENSE-MAKING** The processing speed of an older desktop computer is about 10^8 instructions per second. A new computer can process about 10^{10} instructions per second. The newer computer is how many times as fast as the older one?

2 o.o. m.

100 X

How many orders of magnitude?
How many times as fast?
(different but related questions...)

$-\frac{5}{8}c$

$-5c^2d^5$

$8cd^5fv$

$-\frac{5}{8}$ ccddddd / fddddd · 1

3500 88

1000 10,000 10 100