Zero, Negative, and Complex Negative Exponents Guided Lesson Explanation

1) 6^{-5}

$6^{-5} = 1 \bullet \frac{1}{6} \bullet \frac{1}{6} \bullet \frac{1}{6} \bullet \frac{1}{6} \bullet \frac{1}{6} = \frac{1}{7776}$

2) $162{,}839^{0}$

According to the Zero Power of Exponents, any raised to the power of 0 (zero) is equal to 1.

$162{,}839^{0} = 1$

3) $5r^{-5}$

When you see this for the first time, it can seem very tricky. Please note that the exponent only applies to variable (r).

$5(r^{-5})$

A negative exponent is equal to the inverse of the same base with a positive exponent. So $r^{-5} = \frac{1}{r^5}$

Now we can put the pieces together:

$5 \bullet \frac{1}{r^5} = \frac{5}{r^5}$

4) $\frac{1}{25^{-2}}$

Let's start by making sense of the denominator: 25^{-2}

This tells us that we must divide by 25 two times. $25^{-2} = 1 \bullet \frac{1}{25} \bullet \frac{1}{25} = \frac{1}{625}$

Restate the problem with the simplified denominator:

$\frac{1}{\frac{1}{625}}$

We can now take the reciprocal of the fraction because one over one indicates that. The reciprocal of $\frac{1}{625} = 625$.