

Developing the Power to Power Rule:

$$(x^2)^3 = x^2 \cdot x^2 \cdot x^2 = x^{2+2+2} = x^6$$

$$(x^5)^2 = x^5 \cdot x^5 = x^{5+5} = x^{10}$$

$$(x^{-3})^4 = x^{-3} \cdot x^{-3} \cdot x^{-3} \cdot x^{-3} = x^{-3+-3+-3+-3} = x^{-12} = \frac{1}{x^{12}}$$

So, power raised to another power, we keep the base and _____
the exponents.

Rules for Exponents:

$$x^0 =$$

$$x^1 =$$

$$x^{-a} =$$

$$x^a \cdot x^b =$$

$$\frac{x^a}{x^b} =$$

$$(x^a)^b =$$

Simplify each of the following, leaving only positive exponents in your answers. Show all steps.

$$1. (x^5)^{-2} =$$

$$2. (x^{-7})^{-4} =$$

$$3. (x^{-8})^9 =$$

$$4. (x^{-6})^7 =$$

$$5. (x^{11})^9 =$$

$$6. x^5 \cdot x^{-9} =$$

$$7. \frac{x^6}{x^{-3}} =$$

$$8. \frac{x^{-2}}{x^5} =$$

$$9. (x^5)^8 =$$

$$10. x \cdot x^{11} =$$

$$11. (x^5)^0 =$$

$$12. \frac{x}{x^{15}} =$$

$$13. x^{10} \cdot x^{-32} =$$

$$14. (x^{-8})^6 =$$

$$15. \frac{x^{-12}}{x^{-13}} =$$