Name_____

8.EE.A.1

Manipulating Powers

1) $(a^x)^y = a^{xy}$

2) $a^x \cdot a^y = a^{x+y}$

3) $\frac{a^x}{a^y} = a^{x-y}$

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

5) $\left(\frac{a}{b}\right)^x = \frac{a^x}{b^x}$

6) $a^{-x} = \frac{1}{a^x}$

7) $\frac{1}{a^{-x}} = a^x$

Simplify each expression.

Example: $(x^2)^4 = x^{2 \cdot 4} = x^8$

1. $x^4 \cdot x^2$

2. $\frac{x^8}{x^6}$

3. $(x^2y)^3$

4. $\left(\frac{x}{y^3}\right)^5$

5. y^{-15}

6. $\frac{1}{x^{-15}}$

7. $\frac{a^6}{a^9}$

8. $(2c^2)^3$

9. $\frac{n^4 \cdot n^6}{n^8 \cdot n^2}$

10. $4a^5 \cdot 3a^3$

11. $\left(\frac{v}{3}\right)^4 \cdot \left(\frac{5}{v}\right)^2$

12. $(x^{-2})^2$

13. $\left(\frac{2}{x}\right)^{-1}$