

Investigation: Multiplying Powers

- 1) Expand $x^4 =$ 2) Expand $x^6 =$ 3) Expand $(x^4) \cdot (x^6) = (\quad) (\quad)$
4) Simplify the answer to #3: $x^4 \cdot x^6 =$
(Combine it all together – write it with only **one base and one exponent**)
5) Expand $a^5 =$ 6) Expand $a^2 =$ 7) Expand $(a^5) \cdot (a^2) = (\quad) (\quad)$
8) Simplify the answer to #7: $a^5 \cdot a^2 =$

Simplify: (Write the following with only **one base and one exponent**)

- 9) $y^7 \cdot y^5 =$ 10) $h^8 \cdot h^{10} =$ 11) $6^3 \cdot 6^{14} =$
12) RULE: When multiplying powers with the same base, _____
(explain what you do with the exponents and the bases)

13) To teach your rule to the other table, copy the problem from #8 onto a whiteboard. Have the other table guess what they think the answer will be. Give them some possible options if you like. Then show them how the problem works by expanding. When they seem to understand, make up some more of your own examples. When you're done, they should know the rule for multiplying powers AND why the rule works!

Investigation: Dividing Powers

(This is easier than it looks. How does it relate to parts a – c?)

- 1) a) $\frac{5}{5} =$ b) $\frac{1,872}{1,872} =$ c) $\frac{x}{x} =$ d) $\frac{17 \cdot 42}{17}$
2) Simplify: (Again, this is easier than it looks. How does this relate to #1d?) $\frac{9 \cdot 9 \cdot 9 \cdot 9 \cdot 9}{9 \cdot 9 \cdot 9}$
3) Expand each power: $\frac{(d^8)}{(d^4)} = \frac{(\quad)}{(\quad)}$ 4) Simplify the answer to #3: $\frac{d^8}{d^4} =$
5) Expand each power: $\frac{(h^7)}{(h^2)} = \frac{(\quad)}{(\quad)}$ 6) Simplify the answer to #5: $\frac{h^7}{h^2} =$

Simplify: (Write the following with only **one base and one exponent**)

- 7) $\frac{y^7}{y^5} =$ 8) $\frac{p^{12}}{p^3} =$ 9) $\frac{6^{14}}{6^3} =$

- 10) RULE: When dividing powers with the same base, _____
(explain what you do with the exponents and the bases)

11) To teach your rule to the other table, copy problem #4 from above onto a whiteboard. Have the other table guess what they think the answer will be. Give them some possible options if you like. Then show them how the problem works by expanding. When they seem to understand, make up some more of your own examples. When you're done, they should know the rule for dividing powers AND why the rule works!