Simplifying Exponents: Shortcuts vs. Expanding Worksheet

Name:_____

Directions: For each problem, you will first solve it by using the exponent rules. (The shortcuts) Then, you will solve them again the long way: by expanding. Hopefully, your two answers will match!

1) $4a^4 \cdot 3a^3$

a) Answer using shortcuts: ______ (Do not change this answer, even if you realize later that it's wrong. You will not be penalized)

b) Expand it first, then simplify: ()() =
--------------------------------------	----	-----

c) Based on your answer from b, do you feel like you made a mistake on a? If so, explain this mistake.

$2) \frac{12b^5}{2b}$

a) Answer using shortcuts: ______ (Do not change this answer, even if you realize later that it's wrong. You will not be penalized)

b) Expand it first, then simplify: $\frac{(}{(})$ = _____

c) Based on your answer from b, do you feel like you made a mistake on a? If so, explain this mistake.

3) $(4c^5)^3$

a) Answer using shortcuts: ______ (Do not change this answer, even if you realize later that it's wrong. You will not be penalized)

b) Expand it first, then simplify: ()()() = _____

c) Based on your answer from b, do you feel like you made a mistake on a? If so, explain this mistake.

$4)\frac{d^2}{d^6}$

a) Answer using shortcuts: (Remember to rewrite your answer – don't leave it with a negative exponent!)

b) Expand it first, then simplify: $\frac{(}{(})}{(}$

c) Based on your answer from b, do you feel like you made a mistake on a? If so, explain this mistake.

 $5)\frac{f^8}{f^{-4}}$

a) Answer using shortcuts: (Keep the base, subtract the exponents!)

b) For your second method, rewrite the negative exponent <u>first</u>: move the f^{-4} in the denominator up to the numerator and make the exponent positive, then combine them. Show the work here:

c) Which of the two methods do you prefer and why?

6) $4g^2h^3 \cdot 7g \cdot 2h^5$

a) Answer using shortcuts: _____ (Do not change this answer!)

b) Expand it first, then simplify:

c) Based on your answer from b, do you feel like you made a mistake on a? If so, explain this mistake.

7) $\frac{6j^{5.3}k^7}{9jk^4}$

a) Answer using shortcuts: _____ (Do not change this answer!)

b) Expand it first, then simplify:

c) Based on your answer from b, do you feel like you made a mistake on a? If so, explain this mistake.