

READY, SET, GO!

Name *Key*

Period

Date

READY

Topic: Meaning of Exponents

In the table below there is a column for the exponential form, the meaning of that form, which is a list of factors and the standard form of the number. Fill in the form that is missing.

Exponential Form	List of Factors	Standard Form
5^3	$5 \cdot 5 \cdot 5$	125
1a. $\frac{1}{7^2}, 7^{-2}$	$\frac{1}{7 \cdot 7}$	b. $\frac{1}{49}$
2. 2^{10}	a. $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	b. 1,024
3a. $\sqrt{625}$ or $625^{\frac{1}{2}}$	$\sqrt{5 \cdot 5 \cdot 5 \cdot 5}$	b. 25
4. $81^{\frac{1}{2}}$	a. $\sqrt{3 \cdot 3 \cdot 3 \cdot 3}$	b. 9
5a. $\frac{1}{5^4}, 5^{-4}$	b. $\frac{1}{5 \cdot 5 \cdot 5 \cdot 5}$	$\frac{1}{625}$

Provide at least three other equivalent forms of the exponential expression. Use rules of exponents such as $3^5 \cdot 3^6 = 3^{11}$ and $(5^2)^3 = 5^6$ as well as division properties and others.

	1st Equivalent Form	2nd Equivalent Form	3rd Equivalent Form
7. $2^{10} =$	$(2^2)^5$	$2^8 \cdot 2^2$	$2^3 \cdot 2^7$
8. $3^7 =$	$(3^2)(3^5)$	$3^4 \cdot 3^3$	$(\sqrt{3})^{14}$
9. $13^{-8} =$	$\frac{1}{13^8}$	$13^4 \cdot 13^{-12}$	$13^{-2} \cdot 13^{-6}$
10. $7^{\frac{1}{3}} =$	$\sqrt[3]{7}$	$7^{\frac{2}{3}} \cdot 7^{-\frac{1}{3}}$	$7^{\frac{1}{2}} \cdot 7^{\frac{1}{6}}$
11. $5^1 =$	$5^7 \cdot 5^{-6}$	$5^{-4} \cdot 5^5$	$(\sqrt{5})^2$

Answers above may vary

SET

Topic: Finding equivalent expressions and functions

Determine whether all three expressions in each problem below are equivalent. Justify why or why they are not equivalent.

12. $\frac{5(3^{x-1})}{5 \cdot 3^x \cdot 3} = \frac{15(3^{x-2})}{15 \cdot 3^x \cdot 3} = \frac{\frac{5}{3}(3^x)}{15 \cdot 3^x \cdot \frac{1}{9}} = \frac{5}{3}(3^x)$
13. $\frac{64(2^{-x})}{64(\frac{1}{2})^x} = \frac{64}{\frac{64}{2^x}} = 64(\frac{1}{2})^x = 64(\frac{1}{2})^x$
14. $\frac{3(x-1)+4}{3x-3+4} \neq \frac{3x-1}{3x-6+7}$
15. $\frac{50(2^{x+2})}{50 \cdot 2^x \cdot 2^2} = \frac{25(2^{2x+1})}{25 \cdot 2^{2x} \cdot 2^1} = \frac{50(4^x)}{50 \cdot 4^x}$
16. $\frac{30(1.05^x)}{30(1.05^{\frac{1}{x}})} \neq \frac{30(1.05^{\frac{x}{x}})}{30(1.05)^x}$
17. $\frac{20(1.1^x)}{20(1.1^{-1})^{-1x}} \neq \frac{20(1.1^{\frac{1}{5} \cdot 5x})}{20(1.1)^x}$

GO

Topic: Using rules of exponents

Simplify each expression. Your answer should still be in exponential form.

18. $7^3 \cdot 7^5 \cdot 7^2 = 7^{10}$
19. $(3^4)^5 = 3^{20}$
20. $(5^3)^4 \cdot 5^7 = 5^{12} \cdot 5^7 = 5^{19}$
21. $x^3 \cdot x^5 = x^8$
22. $x^{-b} = \frac{1}{x^b}$
23. $x^a \cdot x^b = x^{a+b}$
24. $(x^a)^b = x^{ab}$
25. $\frac{y^a}{y^b} = y^{a-b}$
26. $\frac{(y^a)^c}{y^b} = y^{ac-b}$
27. $\frac{(3^4)^6}{3^7} = \frac{3^{24}}{3^7} = 3^{17}$
28. $\frac{r^5 s^3}{r s^2} = r^4 s$
29. $\frac{x^5 y^{12}}{x^8 y^9} = \frac{y^3}{x^3}$

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