Name _____ Per. _____ Date _____

Exponential Functions Review Sheet

SIMPLIFYING EXPONENTIAL EXPRESSIONS

*Use properties of exponents to **simplify** each expression.*

1. $(2a^2)^3$

$2^3 a^{2\cdot 3}$

$\boxed{8a^6}$

2. $2x^4z \cdot 3z^4x^3$

$2\cdot 3 \cdot x^4 x^3 \cdot z z^4$

$6x^{4+3} z^{1+4}$

$\boxed{6x^7z^5}$

3. $[(p^3)^3]^2$

$p^{3\cdot 3\cdot 2} = \boxed{p^{18}}$

4. $\frac{x^6}{x^8} = x^{6-8} = x^{-2}$

$= \boxed{\frac{1}{x^2}}$

5. $\frac{b^0c^{-2}}{a^{-5}} = \frac{c^{-2}}{a^{-5}} = \boxed{\frac{a^5}{c^2}}$

6. $\left(\frac{8x^3}{y}\right)^2$

$= \frac{8^2 x^{3\cdot 2}}{y^2} = \boxed{\frac{64x^6}{y^2}}$

RATIONAL EXPONENTS

*Convert any radicals to **exponential form**, and express rational exponents in **radical form**.*

7. $\sqrt[5]{wy}^3 = (wy)^{3/5}$

num. = 3
denom. = 5

8. $mp^{\frac{2}{7}}$

index: 7
power: 2

$\boxed{m\sqrt[7]{p^2}}$

9. $4\sqrt{bd}^9$

num: 9
denom: 4

$\boxed{4(bd)^{9/4}}$

***Solve** the given equations for x.*

10. $6^{x+3} = 6^5$

$x+3=5$

$\boxed{x=2}$

11. $3^{5x-3} = 3^{4x+7}$

$5x-3 = 4x+7$

$5x-4x = 7+3$

$\boxed{x=10}$

SCIENTIFIC NOTATION

*Express each number in **scientific notation**.*

12. 980,200,000,000,000

9.802×10^{14}

13. 0.00000000008

8×10^{-11}

*Express each number in **standard form**.*

14. 1.86×10^{-4}

.000186

15. 4.9×10^5

490,000

*Simplify. Show your work. Final answers should be written in **scientific notation**.*

16. $(8.8 \times 10^{8})(3.5 \times 10^{-13})$

$8.8 \cdot 3.5 \times 10^{8+-13}$

30.8×10^{-5}

3.08×10^{-4}

17. $(1.35 \times 10^{8})(7.2 \times 10^{-4})$

$1.35 \cdot 7.2 \times 10^{8+-4}$

9.72×10^{8}

18. $\dfrac{(2.376 \times 10^{-4})}{(7.2 \times 10^{-8})}$

$.33 \times 10^{-4--8}$

$.33 \times 10^{4}$

3.3×10^{3}

19. $\dfrac{(8.74 \times 10^{-3})}{(1.9 \times 10^{5})}$

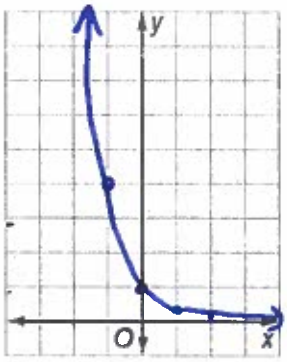
$4.6 \times 10^{-3-5}$

4.6×10^{-8}

EXPONENTIAL FUNCTIONS

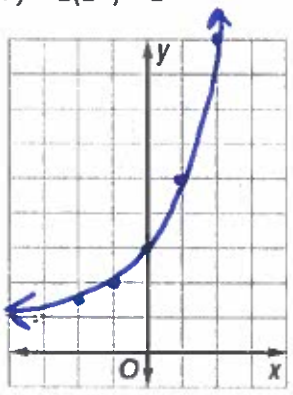
*Graph the given exponential functions using a **table**.*

20. $y = \left(\frac{1}{4}\right)^{x}$



x	$\left(\frac{1}{4}\right)^{x}$	y	(x, y)
-2	$\left(\frac{1}{4}\right)^{-2}$	16	(-2, 16)
-1	$\left(\frac{1}{4}\right)^{-1}$	4	(-1, 4)
0	$\left(\frac{1}{4}\right)^{0}$	1	(0, 1)
1	$\left(\frac{1}{4}\right)^{1}$	1/4	(1, 1/4)
2	$\left(\frac{1}{4}\right)^{2}$	1/16	(2, 1/16)

21. $y = 2(2^{x}) + 1$



x	$2(2^{x})+1$	y
-2	$2(2^{-2})+1 = 2(1/4)+1$	1.5
-1	$2(2^{-1})+1 = 2(1/2)+1$	2
0	$2(2^{0})+1 = 2(1)+1$	3
1	$2(2^{1})+1 = 2(2)+1$	5
2	$2(2^{2})+1 = 2(4)+1$	9

*Determine whether the set of data shown below displays **exponential behavior**. Write **yes** or **no**. If yes, name the **common factor**.*

22.

x	2	5	8	11
y	480	120	30	7.5

$\frac{120}{480} = \frac{1}{4}$ $\frac{30}{120} = \frac{1}{4}$ $\frac{7.5}{30} = \frac{1}{4}$

yes; common factor $= \frac{1}{4}$

23.

x	21	18	15	12
y	30	23	16	9

$\frac{30}{23} = 1.30$ $\frac{23}{16} = 1.44$ ...

NO