Algebra Unit 4
Review

Name: Key

For numbers 1 – 4, simplify the expression, if possible. Write your answer as a power.

1. $2^4 \cdot 2^8$ 2^{12}

2. $(5^2)^7$ 5^{14}

3. $(9 \cdot 10)^5$ $9^5 \cdot 10^5$

4. $(6ab^5)^7$ $6^7 a^7 b^{35}$

For numbers 5 – 6, simplify. Then evaluate the expression when
c = 4 and d = -3. You will have two answers, one when you simplify, then one when you evaluate.

5. $c^3 \cdot c$ c^4 $(4)^4$ or 256

6. $(d^4)^2 = d^8$ $(-3)^8$ or 6561

For numbers 7 – 8, evaluate the expression. Write your answer as a fraction in simplest form.

7. (3^{-3}) $\frac{1}{3^3}$

8. $\left(\frac{2}{5}\right)^{-3}$ $\frac{5^3}{2^3}$

For numbers 9 – 12, rewrite the expression with positive exponents.

9. $m^{-5}n^8$ $\frac{n^8}{m^5}$

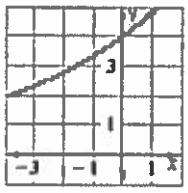
10. $\frac{3}{4g^{-8}h^{-6}}$ $\frac{3g^8h^6}{4}$

11. $6^{-3}k$ $\frac{k}{6^3}$

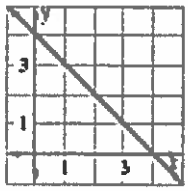
12. $\frac{9j^{-5}}{f^{-9}}$ $\frac{9f^9}{j^5}$

For numbers 13 – 15, match the equation with its graph.

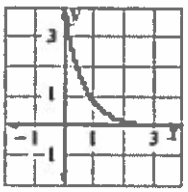
A.



B.



C.



13. $y = 4(1.2)^x$ A

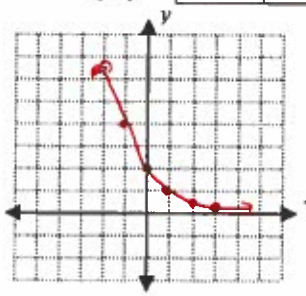
14. $y = 4(0.2)^x$ C

15. $y = 4 - x$ B

16. Complete the table and graph:

$y = 2\left(\frac{1}{2}\right)^x$

x	-1	0	1	2	3
y	4	2	1	.5	.25



D: $\mathbb{R}$

R: $y > 0$ or $\mathbb{R}^+$

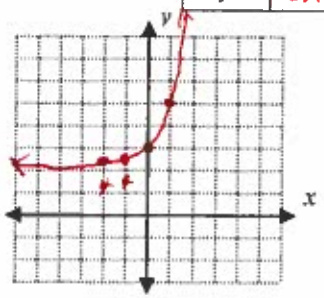
y-int: (0,2)

Decay

17. Complete the table and graph:

$y = (3)^x + 2$

x	-2	-1	0	1	2
y	2.1	2.3	3	5	11



D: $\mathbb{R}$

R: $y > 2$

y-int: (0,2)

Growth

For numbers 18 – 19, evaluate the expression. Write your answer as a fraction in simplest form.

18. $\frac{2^6 \cdot 2^4}{2^3}$ 2^7

19. $\left(\frac{3}{10}\right)^3$ $\frac{3^3}{10^3}$

For numbers 20 – 21, simplify the expression. Write your answer with all positive exponents.

20. $\left(\frac{5x^3y^5}{4x^2y^7}\right)^3 = \left(\frac{5x}{4y^2}\right)^3 = \frac{5^3x^3}{4^3y^6}$

21. $\left(\frac{6x^5y^8}{7xy}\right)^{-2}$ $\left(\frac{6x^4y^7}{7}\right)^{-2}$ $\frac{7^2}{6^2x^8y^{14}}$

22. You deposit $4000 in an account that pays 6% interest compounded yearly. **Find the balance of the account after 5 years.**

$4000(1.06)^5$ $5,352.90

23. A city had a declining population from 1992 to 1998. The population in 1992 was 200,000. Each year for 6 years, the population declined by 3%. Write an exponential model to represent this situation. Then, find the population in 1998.

$y = 200{,}000(.97)^x$ $y = 200{,}000(.97)^6$

166,594

For numbers 24 – 26, classify the model as exponential decay or exponential growth.

24. $y = 10(1.35)^x$ Growth

25. $46(1.86)^x = y$ Growth

26. $y = 2(0.17)^x$ Decay

27. Determine whether the set of data shown below displays exponential behavior. Write yes or no. Explain why or why not.

x	5	0	-5	-10
y	3	4	35	1027

Exponential Getting small fast

Common difference

For problems 28-30, simplify. Solve 31 & 32.

28) $64^{\frac{1}{3}}$ 4

29) $3x^{\frac{5}{4}}$ $\frac{3}{\sqrt[4]{x^5}}$

30) $\sqrt[6]{15{,}625}$ 5

31) $3^{3x+3} = 6{,}561$ 3^8 $3x+3=8$ -3 $3x=5$ $\frac{5}{3}$

32) $625^x = 5$ $(5^4)^x = 5^1$ $\frac{1}{4}$

33. Give your <u>own</u> example of the 7 properties of exponents:

1.

2.

3.

4.

5.

6.

7.