Algebra 1 Sample Worksheet

Student Name_____ Date_____

Notes:

(1) $a^n = a \times a \times a \times \ldots\ldots\ldots \times a$

Example → $3^1 = 3$

$3^2 = 3 \times 3 = 9$

$3^3 = 3 \times 3 \times 3 = 27$

(2) Product Rule : $a^n \cdot a^m = a^{n+m}$

Example: $2^3 . 2^4 = 2^{3+4} = 2^7 = 128$

$a^n . b^n = (a \cdot b)^n$

Example: $3^2 \cdot 4^2 = (3 \cdot 4)^2 = (12)^2 = 144$

(3) Quotient rule : $\frac{a^n}{a^m} = a^{n-m}$

Example: $\frac{2^5}{2^3} = 2^{5-3} = 2^2 = 4$

$$\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$$

Example: $\frac{4^3}{2^3} = \left(\frac{4}{2}\right)^3 = 2^3 = 8$

(4) Power Rules : $(b^n)^m = b^{n \cdot m}$

Example = $(2^3)^2 = 2^6 = 64$

$$b^{n^m} = b^{(n)^m}$$

Example = $2^{3^2} = 2^{(3^2)} = 2^9 = 512$

(5) Zero Rule: $b^0 = 1$

Example = $5^0 = 1$

(6) One Rule : $b^1 = b$

Example $b^1 = b$

1. Identify the base and the exponent.

a. 8^3 Base _____ Exponent _____	b. $(-4)^6$ Base _____ Exponent _____
c. 7^5 Base _____ Exponent _____	d. 4^9 Base _____ Exponent _____

2. Expand and evaluate the following expressions.

a. 8^2	b. 6^3
c. 3^6	d. a^8

3. Evaluate the following expressions.

a. $3^5 + 2^3$	b. $2^6 - 4^3$
c. $10^3 + 13^2$	d. $4^0 + 5^2$

4. Find the value of x to balance the equation.

a. $x^3 = 343$	b. $1296 = x^4$
c. $729 = x^3$	d. $32 = 2^x$

5. Use the product rule and rewrite each expression as a single exponent.

a. $11^2 \times 11^{10}$	b. $13^6 \times 13^4$
c. $2^4 \times 2^4$	d. $7^8 \times 7^6$

6. Write each expression in simplified exponent form.

a. $2^4 \cdot 2^4 \cdot x^2$

b. $t^3 \cdot t^6 \cdot x^2 \cdot x^3$

c. $8^2 \cdot 8^5 \cdot 3^{12} \cdot 3^5$

d. $9^1 \cdot 9^2 \cdot 9^4$

7. Use quotient rule and rewrite each expression as single exponent.

a. $10^{10} \div 10^{3}$	b. $7^{10} \div 7^{9}$
c. $12^{5} \div 12^{2}$	d. $6^{9} \div 6^{3}$

8. Use power rule and rewrite each expression as single exponent.

a. $(10^{2})^{9}$	b. $(2^{7})^{6}$
c. $(11^{6})^{7}$	d. $(6^{9})^{2}$

9. Sum of two numbers is 12 and difference of the same numbers is 4. What is the difference of their squares?

Show Your Work	Rough Work/Verify Work
Final Answer (With Units):	

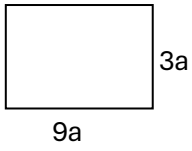
10. Find the product of the following expression.

a. $(4y^2)(8y^5)$

b. $(5q^3)(-6q^2\,p^2)$

c. $(-2a^3b^2c)(-4b^2a^4\,c^4)$

11. Find the area of the below rectangle in terms of 'a'. Also find the value of 'a' if area is 108 square meters.



12. Sean loves Candy and wants to know which amount would be more, a thousand pieces of candy or $(6^2)^3$ pieces of candy?

13. Which expression is equivalent to $\sqrt{200}$?

A. $10\sqrt{2}$
B. $5\sqrt{8}$
C. $4\sqrt{5}$
D. $20\sqrt{2}$

14. Given h(x) = $x^2 - 5x - 14$, which statement is true?

A. The zeros are −2 and 7, because the factors of h(x) are (x+2) and (x−7)
B. The zeros are 2 and −7, because the factors of h(x) are (x−2) and (x+7)
C. The zeros are −7 and 2, because the factors of h(x) are (x+7) and (x−2)
D. The zeros are 7 and 2, because the factors of h(x) are (x−7)and (x−2)

15. What is the equation in slope-intercept form of the line that passes through the points
(−4,5) and (6,25)?

A. Y =2x +13
B. Y = -2x -15
C. Y =5X +24
D. Y = 3x -8

16. Which expression is equivalent to $(a^7b^3)^4$?

A. $a^{11}b^7$
B. $a^{28}b^{12}$
C. $a^{21}b^7$
D. a^7b^{12}

17. What is the equation in standard form of the line that passes through the point (−4, 5) and is parallel to the line represented by
5x − 2y = 12**?**

A. 5x − 2y = −30
B. 5x − 2y = 30
C. 5x + 2y = −30
D. 5x + 2y = 30

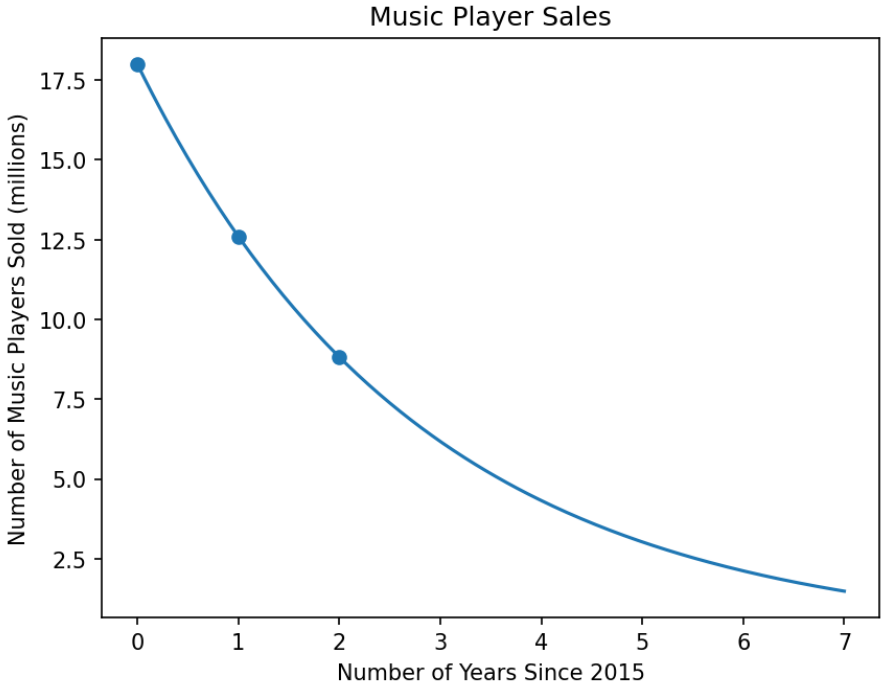
18. Which expression is a factored form of $2x^2 - 25x + 63$?

A. (x + 9)(2x + 7)
B. (x − 9)(2x − 7)
C. (x + 7)(2x + 9)
D. (x − 7)(2x − 9)

19. Which situation best represents causation**?**

A. The number of umbrellas sold affects the amount of rainfall in a city
B. The amount of studying a student does affects the student's test score.
C. The number of movies released affects the number of books in a library.
D. The number of shoes a person owns affects how tall the person grows.

20. The graph shows the number of **music players sold** (in millions) since 2015.



Based on this information, which function best models the number of music players sold (in millions) x years since 2015?

A. $f(x) = 18(0.7)^x$
B. $f(x) = 18(1.3)^x$
C. $f(x) = 12.6(0.7)^x$
D. $f(x) = 18 - 0.7x$