

Algebra I
10.1 Worksheet #2
Properties of Exponents

NAME: _____
DATE: _____ HOUR: _____

For Exercises 1-4, identify the base and the exponent.

1. 5^7 base = 5
exponent = 7

2. 6^6 base = _____
exponent = _____

3. 2^{12} base = _____
exponent = _____

4. 7^4 base = _____
exponent = _____

Evaluate.

5. 10^3 1000

6. 4^7 _____

7. 12^4 _____

8. 9^5 _____

Simplify each product. Leave the product in exponent form.

9. $9^5 \cdot 9^9$ 9^{14}

10. $6^7 \cdot 6^7$ _____

11. $10^6 \cdot 10^{12}$ _____

12. $5^5 \cdot 5^{10}$ _____

13. $4^7 \cdot 4^6$ _____

14. $8^5 \cdot 8^7$ _____

15. $10^{10} \cdot 10^{10}$ _____

16. $12^4 \cdot 12^5$ _____

17. $2^7 \cdot 2^4$ _____

18. $3^8 \cdot 3^3$ _____

19. $10^x \cdot 10^y$ _____

20. $6^a \cdot 6^b$ _____

Simplify each product.

21. $(-x^6)(7x^3)$ $-7x^9$

22. $(9x^4)(-5x^6y^7)$ _____

23. $(-10a^3b^5)(6a^4b^7)$ $-60a^7b^{12}$

24. $(14x^3y^5)(-4x^7z^9)$ _____

25. $(5r^4s^3)(-7r^5s^9)$ _____

26. $(8a^4c^5)(9b^3c^8)$ _____

27. $(-4w^4)(7w^6)(2x^8)$ _____

28. $(3a^2)(4b^5)(-4a^2b^2)$ _____

29. $(-9x^2)(3x^4)(-3x^2)$ _____

30. $(4f^5)(-2e^3)(5e^4f^6)$ _____

Simplify.

1. $(5a)(-ab^2)$
 $-5a^2b^2$

2. $(xy)(-2x)$
 $-2x^2y$

3. $(3x^2)(4x^4)$

4. $(-x^2)(-4x)$

5. $(a^4)^2$

6. $(c^2)^5$

7. $(ab)^4$

8. $(5a)^2$

9. $(x^2)^3$

10. $(2a)^2$

11. $(4n^2)^2$

12. $(-3xy)^2$

For Exercises 1- 4, find the value of x.

1. $5^x \cdot 5^4 = 5^8$ $x = 4$

2. $7^x \cdot 7^3 = 7^{12}$ $x =$

3. $9^6 \cdot 9^x = 9^7$ $x =$

4. $6^9 \cdot 6^x = 6^{18}$ $x =$

Simplify and find the value of each expression when possible.

1. $(-5)^2$ _____ 2. $(-2)^2$ _____ 3. $(-1)^5$ _____
 4. $(5x^3)^2$ _____ 5. $-(3^2)$ _____ 6. $(-7)^4$ _____
 7. $-(w^2)^2$ _____ 8. $(8^2)^2$ _____ 9. $-(4^3)^2$ _____
 10. $-(10^2)$ _____ 11. $(5x^5)^2$ _____ 12. $(2b^3)^2$ _____

Evaluate each monomial for $a = -2$, $b = 3$, and $c = -5$.

13. a^4 $(-2)^4 = 16$ _____ 14. $(a^2c)^3$ _____ 15. a^2c^4 _____
 16. $-(a^b)$ $-((-2)^3) = 8$ _____ 17. $(ac)^4$ _____ 18. a^2b^3 _____
 19. $-5c^5$ $-5(-5)^5 = 15,625$ _____ 20. $(bc)^2$ _____

Give the algebraic factorization. (match with below)

21. $15a^3$ 3·5·a·a·a _____ 22. $12d^2$ _____
 23. $42u^3$ _____ 24. $27a^2b$ _____
 25. $21c^2d$ _____ 26. $74uv^2$ _____
 27. $33ab^2$ _____ 28. $22cd^2$ _____
 29. $70u^2v$ _____ 30. $26a^2b^2$ _____
 31. $18c^2d^2$ _____ 32. $51u^2v^2$ _____
 33. $14ab^3$ _____ 34. $34c^3d$ _____
 35. $49uv^3$ _____ 36. $62a^2b^3$ _____
 37. $65cd^3$ _____ 38. $69u^3v$ _____
 39. $75a^3b^3$ _____ 40. $54c^4d^3$ _____

Check yourself. Here are scrambled answers for exercises 22–40:

- | | | | |
|---|---|---|--|
| $3 \cdot 7 \cdot c \cdot c \cdot d$ | $3 \cdot 17 \cdot u \cdot u \cdot v \cdot v$ | $2 \cdot 37 \cdot u \cdot v \cdot v$ | $5 \cdot 13 \cdot c \cdot d \cdot d \cdot d$ |
| $3 \cdot 11 \cdot a \cdot b \cdot b$ | $3 \cdot 5 \cdot 5 \cdot a \cdot a \cdot a \cdot b \cdot b \cdot b$ | $2 \cdot 5 \cdot 7 \cdot u \cdot u \cdot v$ | $2 \cdot 17 \cdot c \cdot c \cdot c \cdot d$ |
| $2 \cdot 13 \cdot a \cdot a \cdot b \cdot b$ | $2 \cdot 31 \cdot a \cdot a \cdot b \cdot b \cdot b$ | $2 \cdot 3 \cdot 3 \cdot c \cdot c \cdot d \cdot d$ | $2 \cdot 11 \cdot c \cdot d \cdot d$ |
| $3 \cdot 23 \cdot u \cdot u \cdot u \cdot v$ | $3 \cdot 3 \cdot 3 \cdot a \cdot a \cdot b$ | $2 \cdot 2 \cdot 3 \cdot d \cdot d$ | $2 \cdot 3 \cdot 7 \cdot u \cdot u \cdot u$ |
| $2 \cdot 3 \cdot 3 \cdot 3 \cdot c \cdot c \cdot c \cdot d \cdot d \cdot d$ | $2 \cdot 7 \cdot a \cdot b \cdot b \cdot b$ | $7 \cdot 7 \cdot u \cdot v \cdot v \cdot v$ | |

Simplify each expression. Match with the answers below.

41. $(-2a^2)(-2b^4)$ _____ 42. $(g^3)^6(g^2)^5$ _____
 43. $(3c^2)^3(-4bc^2)^2$ _____ 44. $(-6x^2y^5)^4(xy)^2$ _____
 45. $(-13h^5p^8)^2$ _____ 46. $(-5t^4v^9)^3$ _____

$1296x^{10}y^{22}$ $432b^2c^{10}$ $-125t^{12}v^{27}$ q^{28} $4a^2b^4$ $169h^{10}p^{16}$