

- Exponent laws with whole-numbered exponents and whole-number exponent outcomes when simplified
- Includes variable bases
- $2^7 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$ ;  $n^4 = n \times n \times n \times n$
- Exponent laws (ex.  $6^0 = 1$ ;  $m^1 = m$ ;  $n^5 \times n^3 = n^8$ ;  $\frac{y^7}{y^3} = y^4$ ;  $(5n)^3 = 5^3 \times n^3 = 125n^3$ ;  $\left(\frac{m}{n}\right)^5 = \frac{m^5}{n^5}$ ; and  $(3^2)^4 = 3^8$ )
- $(-3)^2 \neq -3^2$

1.  $2^6$

2. Simplify  $a \times a \times a \times a \times a$

3.  $1^0 + 3^0$

4.  $0^1 + 0^5$

5.  $-3^4 + (-3)^4$

6.  $n \times n^7 \times n^4$

7. Simplify  $(3x^3)^3$

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

9.  $\left(\frac{2a}{b^2}\right)^3$

10.  $(-1)^{100} + (-1)^{123}$

11.  $\left(a \times \frac{a^5}{a^2}\right)^2$

12.  $\frac{x^5}{x^3} \div \frac{x}{x^2}$

$$13. \frac{(-3)^{100}}{(-3)^{98}}$$

$$14. \frac{(-2)^{101}}{-2^{100}}$$

$$15. -2(-2)^2 - (-3)^2$$

$$16. \frac{9x^4y^4}{3xy^2}$$

$$17. ((2x^2)^3)^2$$

$$18. \left(\frac{4p^4q^6}{2p^8q^3}\right)^3$$

$$19. -2\left(-\frac{3}{4}\right)^2 + (-1)^3 - \left(\frac{-2^4}{(-2)^3}\right)^2$$

$$20. \text{Solve } 25^2 = 125^k$$

$$21. \text{Solve } \frac{3^{10}}{3^x} = 3^{x+1}$$

22. Challenge:

a.  $0^0$

b.  $\left[\frac{(-3)^3}{3^2}\right]^2 - \left[\frac{(-3)^4}{3^3}\right]^1 + \left[\frac{(-3)^1}{3}\right]^0$

c.  $\left(\frac{2^{1-2x}}{2^{x+3}}\right)^3 \div 2$

d. Solve  $32 \times 2 + 2^{x+1} = 3 \times 2^x$