

Name

Exponents

Evaluate each of the following.

1.  $2^3 = 2 \times 2 \times 2$   
 $= 8$

2.  $3^2$

3.  $4^3$

4.  $8^2$

5.  $2^5$

6.  $(-3)^2$

7.  $(-2)^3$

8.  $-3^2$

9.  $(\frac{1}{2})^4$

10.  $(\frac{1}{4})^2$

11.  $(\frac{3}{4})^3$

12.  $(\frac{2}{3})^3$

13.  $(-\frac{1}{3})^2$

14.  $-(\frac{1}{3})^2$

15.  $3(2)^3$

16.  $2(-5)^2$

17.  $2^2 + 3^2$

18.  $(2 + 3)^2$

19.  $2^3 + 3^2$

20.  $(2 \times 3)^3$

21.  $3^2 - 2^3$

22.  $4^2 - 5^2$

23.  $4 \times 5^2 + (3 + 1)^2$

24.  $(3 - 5)^5$

25.  $6^3 - 2 \times 5^2 - (1 + 2)^2$

26.  $(-3)^3 - (-5)^2$



### Multiplying powers

Write each product as a single power.

$$1. 2^3 \times 2^5 = 2^{3+5} \\ = 2^8$$

$$2. 5^3 \times 5^4$$

$$3. 10^5 \times 10^3$$

$$4. 4 \times 4^3$$

$$5. y^2 \times y^3$$

$$6. b^5 \times b^4$$

$$7. 5^2 \times 5^4 \times 5^3$$

$$8. 3^4 \times 3^2 \times 3$$

$$9. h^5 \times h^3 \times h^7$$

$$10. h \times h^6 \times h^3$$

Simplify each expression.

$$11. a^3 \times b^2 \times a^5 \times b = a^{3+5} \times b^{2+1} \\ = a^8 b^3$$

$$12. w \times w^4 \times s^2 \times s^3$$

$$13. r^3 \times t \times t^2 \times r$$

$$14. p^2 \times p \times p \times h^2 \times h^3$$

$$15. d^3 \times c \times d^5 \times c^2$$

$$16. 3 \times 3 \times 3 \times 5 \times 5$$

$$17. 2 \times 2 \times 2 \times 2 \times 6 \times 6 \times 6 \times 6 \times 6$$

$$18. 5 \times 7 \times 7 \times 5 \times 5 \times 7 \times 7 \times 7$$

$$19. m^3 \times m \times n^5 \times m^2 \times n^7$$

$$20. 5^2 \times 5^2 \times 5^2$$

Name \_\_\_\_\_



*Dividing powers*

Write each quotient as a single power.

1.  $5^8 \div 5^4 = 5^{8-4}$   
 $= 5^4$

2.  $7^5 \div 7^2$

3.  $2^9 \div 2^5$

4.  $3^5 \div 3$

5.  $10^8 \div 10^2$

6.  $4^{13} \div 4$

7.  $a^7 \div a^2$

8.  $k^4 \div k^3$

9.  $y^9 \div y^3$

10.  $t^7 \div t$

Simplify each expression.

11.  $7^{10} \div 7^4 \times 7^6 = 7^{10-4+6}$   
 $= 7^{12}$

12.  $10^8 \times 10^2 \div 10^4$

13.  $5^6 \div 5^2 \times 5^3$

14.  $6^{12} \div 6^5 \times 6^{10}$

15.  $b^9 \times b^4 \div b^{12}$

16.  $z^{10} \div z^5 \times z$

17.  $w^7 \times w^3 \div w^5$

18.  $s^{10} \div (s^3 \times s^4)$

19.  $(2^{13} \times 2^4) \div (2^2 \times 2^5)$

20.  $(c^4 \div c^2) \times (c^{15} \div c^7)$



### Powers of powers

Write each as a single power.

$$1. (10^2)^3 = 10^2 \times 3 \\ = 10^6$$

$$2. (5^4)^2$$

$$3. (3^5)^7$$

$$4. (7^4)^5$$

$$5. (a^7)^3$$

$$6. (y^6)^2$$

$$7. (b^8)^9$$

$$8. (2x^2)^2$$

$$9. (3c^2)^3$$

$$10. 3(d^2)^3$$

Simplify each expression.

$$11. (k^2 \times k^5 \div k^4)^2 = (k^{2+5-4})^2 \\ = (k^3)^2 \\ = k^6$$

$$12. (m^2 \times m^3)^7$$

$$13. (d^3 \div d)^4$$

$$14. (4^5 \times 4^7 \div 4^9)^3$$

$$15. (3^5 \times 3^7) \div (3^2)^5$$

$$16. (r^6 \div r^2) \times (r^4 \div r^2)^3$$

$$17. \left(\frac{a^2}{b^3}\right)^4$$

$$18. (s^3 t^5)^4$$

$$19. \left(\frac{2^5}{3^3}\right)^2$$

$$20. (2^5 \times 3^3)^7$$