



Simplifying a Power of a Power **Answers**

Bronze

Write each of the following as a single power of 2.

a. $(2^3)^2$

$$2^{3 \times 2}$$

$$2^6$$

e. $(2^2)^4$

$$2^{2 \times 4}$$

$$2^8$$

i. $(2^{12})^3$

$$2^{12 \times 3}$$

$$2^{36}$$

b. $(2^4)^3$

$$2^{4 \times 3}$$

$$2^{12}$$

f. $(2^{10})^8$

$$2^{10 \times 8}$$

$$2^{80}$$

j. $(2^7)^4$

$$2^{7 \times 4}$$

$$2^{28}$$

c. $(2^6)^5$

$$2^{6 \times 5}$$

$$2^{30}$$

g. $(2^5)^7$

$$2^{5 \times 7}$$

$$2^{35}$$

d. $(2^{10})^2$

$$2^{10 \times 2}$$

$$2^{20}$$

h. $(2^2)^{11}$

$$2^{2 \times 11}$$

$$2^{22}$$

**Silver**Write each of the following as a single power of x .

a. $(x^3)^2$

$x^{3 \times 2}$

x^6

d. $(x^{10})^{12}$

$x^{10 \times 12}$

x^{120}

g. $(x^7)^8$

$x^{7 \times 8}$

x^{56}

b. $(x^5)^8$

$x^{5 \times 8}$

x^{40}

e. $(x^7)^6$

$x^{7 \times 6}$

x^{42}

h. $(x^2)^{13}$

$x^{2 \times 13}$

x^{26}

c. $(x^2)^5$

$x^{2 \times 5}$

x^{10}

f. $(x^4)^{11}$

$x^{4 \times 11}$

x^{44}

Gold

Simplify each of the following.

a. $(6x^2)^2$

$6^2 = 36$

$36x^{2 \times 2}$

$36x^4$

e. $(2c^2)^5$

$2^5 = 32$

$32c^{2 \times 5}$

$32c^{10}$

i. $(5d^3)^3$

$5^3 = 125$

$125d^{3 \times 3}$

$125d^9$

b. $(3y^3)^3$

$3^3 = 27$

$27y^{3 \times 3}$

$27y^9$

f. $(7a^4)^2$

$7^2 = 49$

$49a^{4 \times 2}$

$49a^8$

j. $(2v^4)^6$

$2^6 = 64$

$64v^{4 \times 6}$

$64v^{24}$

c. $(4m^2)^2$

$4^2 = 16$

$16m^{2 \times 2}$

$16m^4$

g. $(2m^3)^4$

$2^4 = 16$

$16m^{3 \times 4}$

$16m^{12}$

d. $(5z^2)^2$

$5^2 = 25$

$25z^{2 \times 2}$

$25z^4$

h. $(7x^2)^3$

$7^3 = 343$

$343x^{2 \times 3}$

$343x^6$

Challenge

 Simplify $(\frac{1}{2}x^2)^2$

$(\frac{1}{2})^2 = \frac{1}{4}$

$\frac{1}{4}x^{2 \times 2}$

$\frac{1}{4}x^4$