Multiplying Powers

1. Write using exponents or simplify.

   a. $b \cdot b \cdot b \cdot b$ **b.** $b + b + b + b$

   c. $2 \cdot p \cdot m \cdot m \cdot p \cdot m$ **d.** $a + a + a + b + b$

2. Complete.

   a. $(p^2)(p^3) = (p \cdot p)(\boxed{} \cdot \boxed{} \cdot \boxed{}) = p^{\boxed{}}$ **b.** $(p^2)^3 = (p^2)(\boxed{})(\boxed{}) = p^{\boxed{}}$

   c. $(2w^5)^2 = (\boxed{})(\boxed{}) = \boxed{}w^{\boxed{}}$ **d.** $(-5p)^3 = (\boxed{})(\boxed{})(\boxed{}) = \boxed{}p^{\boxed{}}$

3. Here are some errors. Fix them.

a. $(3p)^2 = 3p^2$	**b.** $6(ab)^2 = 6ab^2$	**c.** $(2x^3)(4x^7) = 8x^{21}$	**d.** $(2x^2y)^5 = 32x^2y^5$

4. Simplify.

   a. $(m^2)(m^7)(2n)(5n)$ **b.** $(x^2y)(x^4y^6)$ **c.** $(ab^3)^5$

   d. $(4r)^2$ **e.** $(3s^5)^2$ **f.** $-2(xy)^4$

   g. $(0.1w)^2(10w)^3$ **h.** $(4s^{10})(2s^3)^2$ **i.** $(-2x^3)(-2x)^3$

   j. $\left(\frac{1}{3}x\right)^3$ **k.** $\left(-\frac{2}{5}z^2y\right)^2$ **l.** $\left(\frac{1}{2}xy\right)^3(10x^2y^5)$

   m. $\left(\frac{2}{5}x\right)^2(15x^4)$ **n.** $\left(-\frac{2}{5}m^2\right)\left(\frac{15}{16}m^6\right)$ **o.** $\left(-\frac{2}{3}y\right)^2(-9y)^4$

   p. $[(-4)^2]^2$ **q.** $[(2x)^3]^2$ **r.** $[(-4a)^2]^4$

5. **a.** Find an integer *m* so that $(a + b)^m = a^m + b^m$ is true for all real numbers *a* and *b*.

   b. Find *a* and *b* so that $(a + b)^2 = a^2 + b^2$.

   c. Find *a* and *b* so that $(a + b)^2 \neq a^2 + b^2$.

6. Complete the proof that shows what the value of x^0 is.

> Let x be any real number, and m be any positive integer > 0. Then, according to the law of multiplication of exponents, $(x^m)(x^0) = x^{\boxed{} + \boxed{}} = x^{\boxed{}}$.
>
> Looking at the first and the last expressions in the equation above, $(x^m)(x^0) = x^m$
>
> So x^0 must be $\boxed{}$, since that is the only number that does not change the result of multiplication.