

## Rules of Exponents

Simplify the following:

$$(1) x^3 \cdot x^7 \cdot (x^3)^5$$

$$(2) (x^{-3})(x^h)^2(x)$$

$$(3) q^{-4} \cdot \frac{4q}{(q^{-2})^3}$$

$$(4) \frac{3}{y^2} \frac{y}{y^{-8}}$$

$$(5) \left(\frac{2y}{x}\right)^2$$

$$(6) \frac{a}{a^4} \left(\frac{3}{a^2}\right)^{-3}$$

$$(7) z^{-\frac{1}{3}} z^{0.5}$$

$$(8) (x^{\frac{1}{2}})^{\frac{1}{3}} x^{\frac{1}{4}}$$

$$(9) (x\sqrt{2})\sqrt{2}$$

$$(10) \left(\frac{1}{x}\right)^{-\frac{1}{2}}$$

$$(11) \left(\frac{1}{x^{-2}}\right)^{\frac{1}{2}}$$

$$(12) \left(\frac{x^{-\frac{1}{2}}}{x^2}\right)^2$$

$$(13) \frac{(x+2)(x-3)}{x(x+2)^{-2}(x-3)^{1/2}}$$

$$(14) (x+1)^{1-\pi}(x+1)^{1+\pi}$$

$$(15) \left(\frac{x^{4/3}x^3}{x^{-2}}\right)^3 \left(\frac{x^{-1}}{x}\right)$$

$$(16) \left(\frac{(x-1)^{-2}(x+1)^3}{x^2-1}\right)^2$$