

Simplify the following, and evaluate for the given values.

1. $\frac{(x^2y^3)^{-2}}{x^3y^{-2}}$ $x = -1, y = 2$

2. $\frac{(3\sqrt{a^3b})^4}{9a^2b^3}$ $a = 1, b = 6$

3. $\left(\frac{p^{-2}q^3r}{\sqrt{p^2qr^3}}\right)^{-2}$ $p = -1, q = -\frac{1}{2}, r = \frac{1}{6}$

4. $\frac{(8a^2b^{-1}c^5)^{\frac{2}{3}}}{6(a^2b^{-10}c^{14})^{\frac{1}{6}}}$ $a = \frac{1}{2}, b = \frac{1}{3}, c = -8$

5. $\sqrt[3]{\left(\frac{-64x^5y^{-2}z^3}{x^{-1}yz^6}\right)^2}$ $x = -3, y = -1, z = 8$

Answers: 1. $-\frac{1}{16}$ 2. $\frac{3}{2}$ 3. $-\frac{16}{3}$ 4. $-\frac{8}{9}$ 5. $\frac{81}{4}$