

Simplify each expression so that all exponents are positive.

1.  $x^{a-2} \cdot (x^{a+2})^2$  → ① multiply exponents

$x^{a-2} \cdot x^{2a+4}$

$x^{a-2+2a+4}$  → ② add exponents

$x^{3a-2}$

2.  $\frac{a^{2m} \cdot b^{2m+1}}{(a^2b^2)^m}$  → ① multiply exponents

$\frac{a^{2m} \cdot b^{2m+1}}{a^{2m} b^{2m}}$  → ② cancel  $a^{2m}$

→ ③ subtract exponents

$b^{2m+1-2m} = b^1 = b$

3.  $\frac{(ax^2)^{-1}}{a^{-2}x^{-2}}$  → ① multiply exponents

$\frac{a^{-1}x^{-2}}{a^{-2}x^{-2}} = \frac{a^2}{a^1} = a$

② cancel  $x^{-2}$

③ move  $a^{-1}$  and  $a^{-2}$  to become +

4.  $\sqrt[8]{x^8}$  →  $(x^8)^{\frac{1}{8}}$  →  $|x|$

$\sqrt[4]{x^8}$  →  $(x^8)^{\frac{1}{4}}$  →  $x^2$

even even odd ∴  $|x|$

even even even ∴  $x^2$

5.  $\sqrt[5]{\frac{5}{8}}$

$\frac{\sqrt[5]{5}}{\sqrt[5]{8}} = \frac{\sqrt[5]{5} \cdot \sqrt[5]{2^2}}{\sqrt[5]{2^3} \cdot \sqrt[5]{2^2}} = \frac{\sqrt[5]{5 \cdot 4}}{\sqrt[5]{2^5}}$

① change 8 to  $2^3$

② rationalize by multiplying by  $\sqrt[5]{2^2}$  to make it  $\sqrt[5]{2^5}$

$= \frac{\sqrt[5]{20}}{2}$

③ simplify

5 things!

6.  $\sqrt[3]{375a^5b^4c^3}$

①  $\sqrt[3]{5^3 \cdot 3 \cdot a^3 \cdot a^2 \cdot b^3 \cdot b \cdot c^3}$

②  $5abc \sqrt[3]{3a^2b}$

③

375  
 11  
 5 75  
 11  
 5 15  
 11  
 5 3

① find factors of each term and break them apart

② pull out anything that is a cube

ex.  $\sqrt[3]{5^3} = 5$