Given this rational expression: $\frac{25c^4}{4d^9}$

Why can you do this?

$$\frac{(25c^4)\cdot 2}{(4d^9)\cdot 2}$$

THIS IS ACTUALLY = 1

Here you are actually multiplying the original expression by 1, and this doesn't change the value of the expression.

But you can't do this?

$$\frac{\sqrt{25c^4}}{\sqrt{4d^9}}$$

This is the same as taking the square root of the whole ratio which changes the value of the original expression.

Simplify.

$$\frac{\sqrt[3]{m^5}}{\sqrt[4]{m^3}} = \frac{m^{\frac{5}{3}}}{m^{3/4}} = m^{\frac{5}{3}-\frac{3}{4}} = m^{\frac{20}{12}-\frac{9}{12}} = m^{\frac{11}{12}}$$

Simplify.

$$\left(\frac{2g^{-5}h^{-\frac{1}{2}}}{54gh^4}\right)^{-\frac{1}{3}}$$

The following is only one of the many ways to simplify this expression.

1. simplify inside parentheses first

$$= \left(\frac{1}{27g^6h^{9/2}}\right)^{-1/3}$$

2. apply the neg. on the exponent

$$= \left(27g^6h^{\frac{9}{2}}\right)^{\frac{1}{3}}$$

3. apply the $\frac{1}{3}$ power

$$= 27^{\frac{1}{3}}\, g^{6\cdot\frac{1}{3}}\, h^{\frac{9}{2}\cdot\frac{1}{3}}$$

$$= \sqrt[3]{27}\, g^2 h^{\frac{3}{2}}$$

$$= 3g^2h^{3/2}$$

Simplify without using a calculator.

$$3^{\frac{1}{2}}\cdot 27^{\frac{1}{2}} \longrightarrow 3^{\frac{1}{2}}\cdot\left(3^3\right)^{1/2} = 3^{\frac{1}{2}}\cdot 3^{\frac{3}{2}} = 3^{\frac{1}{2}+\frac{3}{2}} = 3^2 = 9$$

or

$$\sqrt{3}\cdot\sqrt{27} = \sqrt{81} = 9$$

Simplify without using a calculator.

$8^{\frac{4}{3}}$

$\sqrt[3]{8^4}$ or $(\sqrt[3]{8})^4$

$(2)^4 = 16$

There are other ways to simplify this. They all lead to the same answer.

$6^{\frac{3}{2}}$

$\sqrt{6^3}$ or $(\sqrt{6})^3$

$= \sqrt{6 \cdot 6 \cdot 6}$

$= \sqrt{6^2 \cdot 6}$

$= 6\sqrt{6}$

Simplify without using a calculator.

$25^{\frac{2}{3}}$

$(\sqrt[3]{25})^2$ or $\sqrt[3]{25^2}$

$\sqrt[3]{625}$ or $\sqrt[3]{25 \cdot 25}$

$= \sqrt[3]{125 \cdot 5}$ $= \sqrt[3]{5 \cdot 5 \cdot 5 \cdot 5}$

$= 5\sqrt[3]{5}$ $= \sqrt[3]{5^3 \cdot 5}$

$= 5\sqrt[3]{5}$

OR $25^{2/3} = (5^2)^{2/3} = 5^{4/3} = \sqrt[3]{5^4} = \sqrt[3]{5 \cdot 5 \cdot 5 \cdot 5}$

$= \sqrt[3]{5^3 \cdot 5} = 5\sqrt[3]{5}$

Simplify without using a calculator.

$4^{-\frac{5}{2}} =$

$\frac{1}{4^{5/2}}$

$\frac{1}{(\sqrt{4})^5}$ or $\frac{1}{\sqrt{4^5}}$

$\sqrt{4} = 2$

$= \frac{1}{(2)^5}$

$= 1/32$

Simplify without using a calculator.

$9^{1.5} = 9^{3/2}$

$(\sqrt{9})^3$ or $\sqrt{9^3}$

$(3)^3$

$= 27$

You can now finish Hwk #2: Sec 7-4

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Problems 39, 40, 42, 44, 46, 49, 66, 67, 70, 72