Answer "CRITIQUE & EXPLAIN" a, b, and c in Student Companion on page 117.

1. $24^2 = 400 + 16 = 416$

A. is Olivia's work in the first example correct? Explain your thinking.

$24^2 = (20+4)^2$ BUT

$(20+4)^2 \neq 20^2 + 4^2$

2. $3^6 = 9(27) = 270 - 27 = 243$

B. is Olivia's work in the second example correct? Explain your thinking.

$9(27) = 3^2(3^3)$ but $3^2(3^3) = 3^5$ not 3^6

3. $\sqrt{625} = \sqrt{400} + \sqrt{225} = 20 + 15 = 35$

C. is Olivia's work in the third example correct? Explain your thinking.

$\sqrt{625}$ does equal $\sqrt{400+225}$

but, $\sqrt{400+225} \neq \sqrt{400} + \sqrt{225}$

Properties of Exponents.

Property **Zero as an Exponent**

For every nonzero number a, $a^0 = 1$.

Property **Negative Exponent**

For every nonzero number a and integer n, $a^{-n} = \frac{1}{a^n}$.

Property **Multiplying Powers With the Same Base**

For every nonzero number a and integers m and n, $a^m \cdot a^n = a^{m+n}$.

Property **Raising a Power to a Power**

For every nonzero number a and integers m and n, $(a^m)^n = a^{mn}$.

Property **Raising a Product to a Power**

For every nonzero number a and b and integer n, $(ab)^n = a^n b^n$.

Property **Dividing Powers With the Same Base**

For every nonzero number a and integers m and n, $\frac{a^m}{a^n} = a^{m-n}$.

Property **Raising a Quotient to a Power**

For every nonzero number a and b and integer n, $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$.

Answer "Habits of Mind" in the Student Companion at the bottom of page 117.

You know that $3^2 + 4^2 = 5^2$. Does $\sqrt{3^2} + \sqrt{4^2} = \sqrt{5^2}$? If not, how could you rewrite the equation using radicals so that it is true?

NO, $\sqrt{3^2} + \sqrt{4^2} \neq \sqrt{5^2}$

But if you square root both entire sides of the original eq then it will be true.

$\sqrt{3^2+4^2} = \sqrt{5^2}$

$\sqrt{9+16} = \sqrt{25}$

$\sqrt{25} = \sqrt{25}$ ✓

Answer Example 1 "try It!" in the Student Companion at the top of page 118.

a. $\left(\frac{3}{32^{\frac{2}{5}}}\right)^{\frac{1}{2}}$

$= \frac{3^{1/2}}{(32^{2/5})^{1/2}}$

$= \frac{3^{1/2}}{32^{1/5}}$

$= \frac{\sqrt{3}}{\sqrt[5]{32}}$

$= \frac{\sqrt{3}}{2}$

b. $2a^{\frac{1}{3}}(ab^{\frac{1}{2}})^{\frac{2}{3}}$

$= 2a^{1/3} a^{2/3} (b^{1/2})^{2/3}$

$= 2a^{1/3} a^{2/3} b^{1/3}$

$= 2a^{1/3+2/3} b^{1/3}$

$= 2ab^{1/3}$ or $2a\sqrt[3]{b}$

Rewrite this expression using properties of exponents. Make sure your answer has no exponents that are negative or zero.

1. $\left(w^{\frac{-5}{6}}\right)^2$

$= w^{-\frac{5}{6}\cdot 2}$

$= w^{-\frac{5}{3}}$

$= \frac{1}{w^{\frac{5}{3}}} = \frac{1}{\sqrt[3]{w^5}}$

2. $(-8a^{12})^{\frac{2}{3}}$

$= (-8)^{2/3}(a^{12})^{2/3}$

$= \left(\sqrt[3]{-8}\right)^2 a^{12\cdot\frac{2}{3}}$

$= (-2)^2 a^8$

$= 4a^8$

Hwk #2 Sec 5-2

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Problems 5, 6, 20-22, 26, 28, 29, 31