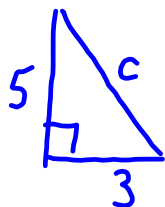


HOMEWORK QUESTIONS???

(page 211, #3 TO #5, #7, #8, #10
and #12 TO #14)

#13.



$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 &= 5^2 + 3^2 \\
 &= 25 + 9 \\
 &= 34 \\
 c &= \sqrt{34} \\
 &\approx 5.8
 \end{aligned}$$

$3\sqrt{2}$ Mixed Radical

$\sqrt{18}$ Entire Radical

Entire Radical \rightarrow Mixed Radical

$$\begin{aligned}
 \sqrt{18} &= \sqrt{9 \times 2} \\
 &= 3\sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 \sqrt{75} &= \sqrt{25 \times 3} \\
 &= 5\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 \sqrt{162} &= \sqrt{9 \times 18} \\
 \sqrt{81 \times 2} &= 3 \times \sqrt{9 \times 2} \\
 9\sqrt{2} &= 9\sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 \sqrt[3]{32} &= \sqrt[3]{8 \times 4} \\
 &= 2\sqrt[3]{4}
 \end{aligned}$$

$$\begin{aligned}
 \sqrt[3]{54} &= \sqrt[3]{27 \times 2} \\
 &= 3\sqrt[3]{2}
 \end{aligned}$$

$$\begin{aligned}
 \sqrt{160} &= \sqrt{16 \times 10} \\
 &= 4\sqrt{10}
 \end{aligned}$$

$$\begin{aligned}
 &\sqrt{4} \times \sqrt{40} \\
 &2\sqrt{40} \\
 &2\sqrt{4 \times 10} \\
 &4\sqrt{10}
 \end{aligned}$$

need
3
of
Something

$$\begin{aligned} \sqrt[3]{1080} &= 108 \times 10 \\ &\quad \begin{array}{c} \wedge \quad \wedge \\ 4 \times 27 \times 2 \times 5 \\ \wedge \quad \wedge \quad \wedge \quad \wedge \\ 2 \times 2 \times 3 \times 9 \times 2 \times 5 \\ \wedge \quad \wedge \quad \wedge \quad \wedge \quad \wedge \\ 2 \times 2 \times 3 \times 3 \times 3 \times 2 \times 5 \end{array} \end{aligned}$$

$$\begin{aligned} \sqrt{36} &= \sqrt{6 \times 6} \\ &= 6 \end{aligned}$$

$$\begin{aligned} \sqrt{49} &= \sqrt{7 \times 7} \\ &= 7 \end{aligned}$$

$$\begin{aligned} 3 \times 2 \sqrt{5} \\ 6\sqrt{5} \end{aligned}$$

$$\begin{aligned} \sqrt[3]{1080} &= \sqrt[3]{216 \times 5} \\ &= 6\sqrt[3]{5} \end{aligned}$$

$$\begin{aligned} \sqrt[3]{56} &= \sqrt[3]{8 \times 7} \\ &= 2\sqrt[3]{7} \end{aligned}$$

$$\begin{aligned} \sqrt[3]{56} &= \sqrt[3]{2 \times 28} \\ &\quad \begin{array}{c} \wedge \quad \wedge \\ 2 \quad 4 \times 7 \\ \wedge \quad \wedge \quad \wedge \\ 2 \times 2 \times 2 \times 7 \end{array} \\ &= 2\sqrt[3]{7} \end{aligned}$$

$$\begin{aligned} \sqrt{36} &= \sqrt{6 \times 6} \\ &= 6 \end{aligned}$$

$$\begin{aligned} \sqrt{2 \times 18} \\ \quad \wedge \quad \wedge \\ \quad 2 \quad 2 \times 9 \\ \hline \sqrt{2 \times 2 \times 3 \times 3} \end{aligned}$$

$$\begin{aligned} 2 \times 3 \\ = 6 \end{aligned}$$

Mixed Radicals \rightarrow Entire Radicals

$$\begin{aligned}5^2\sqrt{2} &= \sqrt{5 \times 5 \times 2} \\ &= \sqrt{50}\end{aligned}$$

$$\begin{aligned}7^3\sqrt{13} &= \sqrt{7 \times 7 \times 7 \times 13} \\ &= \sqrt{4459}\end{aligned}$$

$$\begin{aligned}3^2\sqrt{5} &= \sqrt{3 \times 3 \times 5} \\ &= \sqrt{45}\end{aligned}$$

$$\sqrt{a} = a^{\frac{1}{2}}$$

$$\begin{aligned}\sqrt[3]{n} &= n^{\frac{1}{3}} \quad \wedge \quad \sqrt[3]{8} = 8^{\wedge(1/3)} \\ &= 2\end{aligned}$$

$$\begin{aligned}\sqrt{37} &= 37^{\wedge.5} \\ &= 6.1\end{aligned}$$

8. POWERS WITH RATIONAL EXPONENTS WITH A NUMERATOR OF 1:

$$x^{\frac{1}{n}} = \sqrt[n]{x}$$

EX.:

$$8^{\frac{1}{3}}$$

$$= \sqrt[3]{8}$$

$$= 2$$

WE CAN ALSO USED PRIME FACTORIZATION TO SIMPLIFY A RADICAL.

$2^3 = 8$	$2^4 = 16$
$3^3 = 27$	$3^4 = 81$
$4^3 = 64$	

EX.: Simplify each radical.

$\begin{matrix} 4 \\ 9 \\ 16 \end{matrix}$	a) $\sqrt{80} = \sqrt{4 \times 20}$ $= \sqrt{4 \times 4 \times 5}$ $= 4\sqrt{5}$	b) $\sqrt[3]{144} = \sqrt[3]{8 \times 18}$ $= 2\sqrt[3]{18}$	c) $\sqrt[4]{162}$ $= \sqrt[4]{81 \times 2}$ $= 3\sqrt[4]{2}$
--	--	---	---

YOU TRY!

EX.: Simplify each radical.

$$2^4 = 16$$

$$3^4 = 81$$

$$2^2 = 4$$

$$3^2 = 9$$

$$4^2 = 16$$

$$2^3 = 8$$

$$3^3 = 27$$

a) $\sqrt{63}$

$$\sqrt{9 \times 7}$$

$$3\sqrt{7}$$

$$\sqrt{3 \times 21}$$

$$\sqrt{3 \times 3 \times 7}$$

b) $\sqrt[3]{108}$

$$\sqrt[3]{27 \times 4}$$

$$3\sqrt[3]{4}$$

c) $\sqrt[4]{128}$

$$\sqrt[4]{16 \times 8}$$

$$2\sqrt[4]{8}$$

LET'S TRY TO SIMPLIFY RADICALS WITHOUT USING PRIME FACTORIZATION, IF POSSIBLE.

EX.: Write each radical in simplest form, if possible.

a) $\sqrt[3]{40}$

$$\sqrt[3]{8 \times 5}$$

$$2\sqrt[3]{5}$$

b) $\sqrt{26}$

c) $\sqrt[4]{32}$

$$\sqrt[4]{16 \times 2}$$

$$2\sqrt[4]{2}$$

YOU TRY TO SIMPLIFY RADICALS WITHOUT USING PRIME FACTORIZATION, IF POSSIBLE.

EX.: Write each radical in simplest

form, if possible.

$$\begin{array}{l}
 2^2 = 4 \\
 3^2 = 9 \\
 4^2 = 16 \\
 5^2 = 25
 \end{array}
 \begin{array}{l}
 2^3 = 8 \\
 3^3 = 27
 \end{array}
 \begin{array}{l}
 2^4 = 16 \\
 3^4 = 81
 \end{array}$$

a) $\sqrt{30}$ b) $\sqrt[3]{32}$ c) $\sqrt[4]{48}$

$\sqrt{30}$ $\sqrt[3]{8 \times 4}$ $\sqrt[4]{16 \times 3}$

$2\sqrt{4}$ $2\sqrt{3}$

WRITING MIXED RADICALS AS ENTIRE RADICALS:

EX.: Write each mixed radical as an entire radical.

a) $4\sqrt{3}$ b) $3\sqrt[3]{2}$ c) $2\sqrt[5]{2}$

$\sqrt{4 \times 4 \times 3}$ $\sqrt[3]{3 \times 3 \times 3 \times 2}$ $\sqrt[5]{2 \times 2 \times 2 \times 2 \times 2}$

$= \sqrt{48}$ $\sqrt[3]{54}$ $\sqrt[5]{64}$

CONCEPT REINFORCEMENT:

FPCM 10:

Page 218: 4, 5, 10 - 12, 14, 15, 16, 18