Entire Radical: $\sqrt[r]{a}$ ex: $\sqrt{12}$, $\sqrt[3]{13}$, etc...

Mixed Radical: $a\sqrt[r]{b}$ ex: $2\sqrt{2}$, $3\sqrt[3]{4}$, etc...
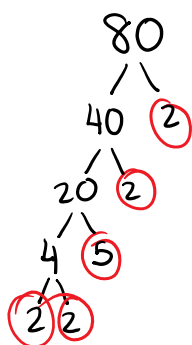
⭐ Radical Property: ⭐

n is an $\mathbb{Z}$ (integer)

$$\sqrt[r]{a \times b} = \sqrt[r]{a} \times \sqrt[r]{b}$$, a & b are $\mathbb{R}$ (real)

Ex: Simplify $\sqrt{8}$ perfect square!

$$\sqrt{8} = \sqrt{4 \times 2} = \sqrt{4} \times \sqrt{2} = 2 \times \sqrt{2} = 2\sqrt{2}$$
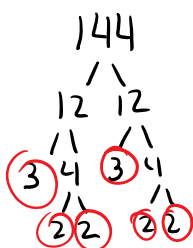
Simplify $\sqrt{80}$

80
40   2
20   2
4   5
2   2

$$\sqrt{80} = \sqrt{2 \times 2 \times 2 \times 2 \times 5} = \sqrt{4 \times 4 \times 5}$$

index
= 2
so take
out pairs.
- OR -

$$= \sqrt{4} \times \sqrt{4} \times \sqrt{5}$$
$$= 2 \times 2 \times \sqrt{5}$$
$$= 4\sqrt{5} \quad \text{Done.}$$

$$\sqrt{16 \times 5}$$
$$= \sqrt{16} \times \sqrt{5}$$
$$= 4\sqrt{5}$$

$$\sqrt{4 \times 4 \times 5 \times 7}$$
$$= \sqrt{4} \times \sqrt{4} \times \sqrt{5 \times 7}$$
$$= 4\sqrt{35}$$

Ex: Simplify $\sqrt[3]{144}$

$$= \sqrt[3]{2 \times 2 \times 2 \times 2 \times 3 \times 3}$$

144
12   12
3 4   3 4
2 2   2 2

index
is 3,
so triples...

$$= \sqrt[3]{2 \times 2 \times 2} \times \sqrt[3]{2 \times 3 \times 3}$$
$$= \sqrt[3]{8} \times \sqrt[3]{18}$$
$$= 2\sqrt[3]{18}$$

Ex: Write as an entire radical:

$$\sqrt{11} \times \sqrt{3} = \sqrt{11 \times 3} = \sqrt{48}$$

Ex: Write as an entire radical,

$4\sqrt{3}$ = $\sqrt{16} \times \sqrt{3}$ = $\sqrt{16 \times 3}$ = $\sqrt{48}$

↳ must be a root to combine with $\sqrt{3}$

$4 = \sqrt{16}$

$2\sqrt[5]{2}$ = $\sqrt[5]{32} \times \sqrt[5]{2}$ = $\sqrt[5]{32 \times 2}$ = $\sqrt[5]{64}$

↳ must be a 5th root to combine with $\sqrt[5]{2}$

$2 = \sqrt[5]{32}$

HW: Pg. 218

#1-5, 7/8, 10/11, 12, 15/16, 18, 22/23