5.2 cont... Dividing Radicals

When dividing radicals :

① divide coefficients (or simplify the fraction)
② divide radicands together
③ then rationalize the denominator
(the denominator will be written so that it is a proper integer , not a radical)

★ You can only divide radicals if they have the same <u>index</u> .

Example : Simplify

a) $\frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

In order to rationalize the denominator , we will multiply numerator and denominator by the radical term in the denominator.

$= \frac{5\sqrt{3}}{\sqrt{9}}$

$= \frac{5\sqrt{3}}{3}$

BUT this works when only have one radical term in

$$= \frac{5\sqrt{3}}{3}$$ Final answer

have one radical term in our denominator

b) $$\frac{3}{2\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$$

$$= \frac{3\sqrt{7}}{2\sqrt{49}}$$

$$= \frac{3\sqrt{7}}{2(7)}$$

$$= \frac{3\sqrt{7}}{14}$$

* opposite sign

c) $$\frac{7}{2+\sqrt{3}} \cdot \frac{(2-\sqrt{3})}{2-\sqrt{3}}$$

For a binomial (2 terms) denominator, we must multiply by the conjugate of the denominator.

$$= \frac{7(2-\sqrt{3})}{(2+\sqrt{3})(2-\sqrt{3})}$$

Conjugate products produce the difference of squares.

$(a-b)(a+b)$

$$= \frac{14 - 7\sqrt{3}}{4 - 2\sqrt{3} + 2\sqrt{3} - \sqrt{9}}$$

$$= \frac{14 - 7\sqrt{3}}{4 - \cancel{2\sqrt{3}} + \cancel{2\sqrt{3}} - \sqrt{9}}$$

$(a-b)(a+b)$

$a^2 - \cancel{ab} + \cancel{ab} - b^2$

$a^2 - b^2$

$$= \frac{14 - 7\sqrt{3}}{4 - 3}$$

$$= 14 - 7\sqrt{3}$$

d) $$\frac{11}{(\sqrt{5} - 7)} \cdot \frac{(\sqrt{5} + 7)}{(\sqrt{5} + 7)}$$

$$= \frac{11\sqrt{5} + 77}{\sqrt{25} + \cancel{7\sqrt{5}} - \cancel{7\sqrt{5}} - 49}$$

$$= \frac{11\sqrt{5} + 77}{5 - 49}$$

$$= \frac{\overset{\div 11}{11}\sqrt{5} + \overset{\div 11}{77}}{\underset{\div 11}{-44}}$$

$$= \frac{\sqrt{5} + 7}{-4} \quad \text{or} \quad \frac{-\sqrt{5} - 7}{4}$$

p. 290 # 6, 8ac, 10

quiz 5.1 & 5.2 tomorrow

tomorrow