

LESSON 22 (5.6): ROOTS (PART 2)

BY THE END OF THE LESSON, YOU WILL BE ABLE TO:

- ★ Simplify radicals by using distribution and FOIL
- ★ Simplify radicals by rationalizing the denominator
- ★ Finding conjugates to rationalize denominators

LESSON 22 (5.6): ROOTS (PART 2)

REVIEW: SIMPLIFY EACH

$$\begin{aligned} \text{1st: } 3\sqrt{5} \cdot 10\sqrt{15} &= 30\sqrt{75} \\ &\quad \quad \quad \uparrow \\ &\quad \quad \quad 25 \cdot 3 \\ &= 30 \cdot 5\sqrt{3} \\ &= \boxed{150\sqrt{3}} \end{aligned}$$

$$\begin{aligned} \text{2nd: } 4\sqrt{10} \cdot 5\sqrt{10} \\ &= 20\sqrt{100} \\ &= 20 \cdot 10 \\ &= \boxed{200} \end{aligned}$$

LESSON 22 (5.6): ROOTS (PART 2)

Multiplying using the distributive property

Just like multiplying polynomials, we can distribute and FOIL radical expressions.

EXAMPLES:

$$1. \sqrt{5}(\sqrt{3} + 2\sqrt{2})$$

$$= \sqrt{15} + 2\sqrt{10}$$

$$2. 6\sqrt{2}(4 - \sqrt{5})$$

$$= 24\sqrt{2} - 6\sqrt{10}$$

LESSON 22 (5.6): ROOTS (part 2)

MORE EXAMPLES

a. $(\sqrt{6} + \sqrt{3})(\sqrt{3} + \sqrt{2})$

$$= \sqrt{18} + \sqrt{12} + \sqrt{9} + \sqrt{6}$$

$\begin{matrix} \wedge & & \wedge \\ 9 \cdot 2 & & 4 \cdot 3 \end{matrix}$

$$= \boxed{3\sqrt{2} + 2\sqrt{3} + 3 + \sqrt{6}}$$

b. $(2\sqrt{3} + 4)(\sqrt{3} + 6\sqrt{5})$

$$= 2\sqrt{9} + 12\sqrt{15} + 4\sqrt{3} + 24\sqrt{5}$$

$$= 2 \cdot 3 \quad \downarrow$$

$$= \boxed{6 + 12\sqrt{15} + 4\sqrt{3} + 24\sqrt{5}}$$

LESSON 22 (5.6): ROOTS (PART 2)

EXAMPLES CONTINUED

$$c. (4\sqrt{5} + 2\sqrt{7})(4\sqrt{5} - 2\sqrt{7})$$

$$= 16\sqrt{25} - \cancel{8\sqrt{35}} + \cancel{8\sqrt{35}} - 4\sqrt{49}$$

$$= 16 \cdot 5 - 4 \cdot 7$$

$$= 80 - 28$$

$$= \boxed{52}$$

$$d. (12 + \sqrt{3})(12 - \sqrt{3})$$

$$= 144 - \cancel{12\sqrt{3}} + \cancel{12\sqrt{3}} - 3$$

$$= 144 - 3$$

$$= \boxed{141}$$

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Journal #22 - Part 2:

★ PG. 293: 21-49 Odds

Due at the end of math lab

Assignment #22:

Due at the beginning of BI class

(Due Tues. Jan 11)