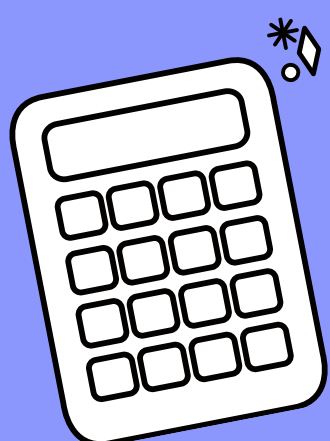


# Multiplying Radical Expressions



## DISTRIBUTIVE LAW

When an expression is beside a bracketed expression, it applies to everything in the brackets.

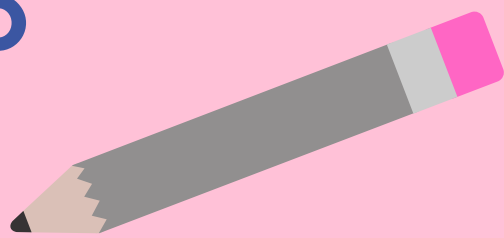


$$\begin{aligned} &\sqrt{9}(x+2) \\ &3 \cdot x + 3 \cdot 2 \\ &= 3x + 6 \end{aligned}$$

## FOIL

first x first / outside x outside / inside x inside / last x last -> used when multiplying two bracketed expressions

$$\begin{aligned} &(2\sqrt{3}+3\sqrt{2})(\sqrt{3}-\sqrt{2}) \\ &2\sqrt{3}(\sqrt{3}) - 2\sqrt{6} + 3\sqrt{6} - 3\sqrt{2}(\sqrt{2}) \\ &6 + \sqrt{6} - 6 \\ &= \sqrt{6} \end{aligned}$$



## DIFFERENCE OF SQUARES

When an expression can be written as  $(a+b)(a-b)$  -> simplify using FOIL without O/I  
Multiply first x first and last x last



$$\begin{aligned} &(2\sqrt{3}+5)(2\sqrt{3}-5) \\ &4\sqrt{3} \cdot \sqrt{3} - 25 \\ &= -13 \end{aligned}$$

# Examples

## DISTRIBUTIVE LAW

$$\sqrt{6}(\sqrt{5}+2)$$

$$\sqrt{6} \cdot \sqrt{5} + \sqrt{6} \cdot 2$$

$$= \sqrt{30} + 2\sqrt{6}$$

## FOIL <sub>2</sub>

$$(\sqrt{5} + \sqrt{3})$$

$$(\sqrt{5} + \sqrt{3})(\sqrt{5} + \sqrt{3})$$

$$5 + \sqrt{15} + \sqrt{15} + 3$$

$$= 8 + 2\sqrt{15}$$

## DIFFERENCE OF SQUARES

$$(2\sqrt{x}-3\sqrt{y})(2\sqrt{x}+3\sqrt{y})$$

$$(2\sqrt{x})(2\sqrt{x})+(-3\sqrt{y})(3\sqrt{y})$$

$$= 4x - 9y$$

\*\*Conjugate = an expression multiplied by another expression with the same factors but a different operation