

Algebra 1

Chapter 10

Section 10-3

Simplify

$$9\sqrt{21} + 4\sqrt{21}$$

$$13\sqrt{21}$$

$$14\sqrt{2} - \sqrt{50}$$

$$\begin{array}{c} \downarrow \quad \swarrow \quad \searrow \\ \sqrt{25} \quad \sqrt{2} \\ 14\sqrt{2} - 5\sqrt{2} \\ 9\sqrt{2} \end{array}$$

Multiply

$$\begin{aligned} & \sqrt{10}(\sqrt{10} - \sqrt{2}) \\ & \sqrt{100} - \sqrt{20} \\ & 10 - \sqrt{4} \cdot \sqrt{5} \\ & 10 - 2\sqrt{5} \end{aligned}$$

$$\begin{aligned} & 9\sqrt{5}(2 + 4\sqrt{2}) \\ & 18\sqrt{5} + 36\sqrt{10} \end{aligned}$$

Simplify by using FOIL

$$(1 - \sqrt{3})(\sqrt{21} + 4)$$

$$\sqrt{21} + 4 - \sqrt{63} - 4\sqrt{3}$$

$$\begin{array}{c} \downarrow \quad \swarrow \quad \downarrow \\ \sqrt{9} \quad \sqrt{7} \end{array}$$

$$\boxed{\sqrt{21} + 4 - 3\sqrt{7} - 4\sqrt{3}}$$

$$(\sqrt{11} + 7)^2$$

$$(\sqrt{11} + 7)(\sqrt{11} + 7)$$

$$\sqrt{121} + 7\sqrt{11} + 7\sqrt{11} + 49$$

$$11 + 14\sqrt{11} + 49$$

$$\boxed{60 + 14\sqrt{11}}$$

Review

take note

Key Concept The Product of a Sum and Difference

Words The product of the sum and difference of the same two terms is the difference of their squares.

Algebra

$$(a + b)(a - b) = a^2 - b^2$$

Examples

$$(x + 2)(x - 2) = x^2 - 2^2 = x^2 - 4$$

O: $-ab$
I: ab

Multiply

$$(\sqrt{14} + 3)(\sqrt{14} - 3)$$

$$\begin{array}{l} \sqrt{196} \leftarrow (\sqrt{14})^2 - 3^2 \quad (\cancel{-3})^2 - 3^2 \\ \rightarrow 14 - 9 \\ \quad \quad \quad 5 \end{array}$$

Simplify the product

$$(\sqrt{11} + \sqrt{6})(\sqrt{11} - \sqrt{6})$$

$$(\sqrt{11})^2 - (\sqrt{6})^2$$

$$11 - 6$$

$$5$$

Simplify the quotient

$$\frac{9}{20 - \sqrt{17}} \cdot \frac{(20 + \sqrt{17})}{(20 + \sqrt{17})}$$

$$\frac{180 + 9\sqrt{17}}{400 - 17}$$

$$\frac{180 + 9\sqrt{17}}{383}$$

$$\frac{\sqrt{3}}{13 + \sqrt{3}} \cdot \frac{(13 - \sqrt{3})}{(13 - \sqrt{3})}$$

$$\frac{13\sqrt{3} - 3}{169 - 3}$$

$$\frac{13\sqrt{3} - 3}{166}$$