

Simplify:

$$\textcircled{a} \sqrt{6} (\sqrt{2} + \sqrt{18})$$

$$\begin{aligned} & \sqrt{12} + \sqrt{108} \\ & 2\sqrt{3} + 6\sqrt{3} \\ & 8\sqrt{3} \end{aligned}$$

$$\textcircled{b} \sqrt[3]{9} (5 - \sqrt[3]{18}) .$$

$$\begin{aligned} & 5\sqrt[3]{9} - \sqrt[3]{162} \\ & 5\sqrt[3]{9} - 3\sqrt[3]{6} \end{aligned}$$

Simplify: (a) $\sqrt{6} (1 + 3\sqrt{6})$ (b) $\sqrt[3]{4} (-2 - \sqrt[3]{6})$.

$$\sqrt{6} + 3\sqrt{36}$$

$$\sqrt{6} + 3 \cdot 6$$

$$\sqrt{6} + 18$$

$$18 + \sqrt{6}$$

$$-2\sqrt[3]{4} - \sqrt[3]{24}$$

$$-2\sqrt[3]{4} - 2\sqrt[3]{3}$$

Simplify: (a) $\sqrt{8} (2 - 5\sqrt{8})$ (b) $\sqrt[3]{3} (-\sqrt[3]{9} - \sqrt[3]{6})$

$$2\sqrt{8} - 5\sqrt{64}$$

$$2\sqrt{8} - 5(8)$$

$$2\sqrt{8} - 40$$

$$2(2)\sqrt{2} - 40$$

$$4\sqrt{2} - 40$$

$$-40 + 4\sqrt{2}$$

$$-\sqrt[3]{27} - \sqrt[3]{18}$$

$$-3 - \sqrt[3]{18}$$

Simplify:

$$(3 - 2\sqrt{7})(4 - 2\sqrt{7})$$

$$12 - 6\sqrt{7} - 8\sqrt{7} + 4\sqrt{49}$$

$$12 - 6\sqrt{7} - 8\sqrt{7} + 4(7)$$

$$12 - 14\sqrt{7} + 28$$

$$40 - 14\sqrt{7}$$

$$(\sqrt[3]{x} - 2)(\sqrt[3]{x} + 4)$$

$$\sqrt[3]{x^2} + 4\sqrt[3]{x} - 2\sqrt[3]{x} - 8$$

$$\sqrt[3]{x^2} + 2\sqrt[3]{x} - 8$$

Simplify: a) $(6 - 3\sqrt{7})(3 + 4\sqrt{7})$ b) $(\sqrt[3]{x} - 2)(\sqrt[3]{x} - 3)$.

$$18 + 24\sqrt{7} - 9\sqrt{7} - 12\sqrt{49}$$

$$18 + 15\sqrt{7} - 12(7)$$

$$-84$$

$$-66 + 15\sqrt{7}$$

$$\sqrt[3]{x^2} - 3\sqrt[3]{x} - 2\sqrt[3]{x} + 6$$

$$\sqrt[3]{x^2} - 5\sqrt[3]{x} + 6$$

Simplify:

$$(3\sqrt{2} - \sqrt{5})(\sqrt{2} + 4\sqrt{5})$$

$$3\sqrt{4} + 12\sqrt{10} - \sqrt{10} - 4\sqrt{25}$$

$$3(2) + 11\sqrt{10} - 4(5)$$

$$6 + 11\sqrt{10} - 20$$

$$-14 + 11\sqrt{10}$$

Simplify: $(\sqrt{6} - 3\sqrt{8})(2\sqrt{6} + \sqrt{8})$

SPECIAL PRODUCTS

Binomial Squares

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

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

Product of Conjugates

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

Simplify:

$$\textcircled{a} (2 + \sqrt{3})^2$$

$$\begin{aligned} & (2 + \sqrt{3})(2 + \sqrt{3}) \\ & 4 + 2\sqrt{3} + 2\sqrt{3} + \sqrt{9} \\ & 4 + 4\sqrt{3} + 3 \\ & 7 + 4\sqrt{3} \end{aligned}$$

$$\textcircled{b} (4 - 2\sqrt{5})^2$$

$$\begin{aligned} & (4 - 2\sqrt{5})(4 - 2\sqrt{5}) \\ & 16 - 8\sqrt{5} - 8\sqrt{5} + 4\sqrt{25} \\ & 16 - 16\sqrt{5} + 4(5) \\ & 36 - 16\sqrt{5} \end{aligned}$$

Simplify: $(5 - 2\sqrt{3})(5 + 2\sqrt{3})$

$$25 + \cancel{10\sqrt{3}} - \cancel{10\sqrt{3}} - 4\sqrt{9}$$

$$25 - 12$$

$$13$$

Simplify: $(3 - 2\sqrt{5})(3 + 2\sqrt{5})$

$$9 + \cancel{6\sqrt{5}} - \cancel{6\sqrt{5}} - 4\sqrt{25}$$

$$9 - 20$$

$$-11$$

Conjugates

$$(1+3i)(1-3i)$$

191, 195, 199

203, 211, 213