

ALGEBRA 1
10.3 PRACTICE WS

Name KEY
Date _____

Simplify each sum or difference.

$$1. 11\sqrt{7} - 4\sqrt{7}$$
$$= 7\sqrt{7}$$

$$2. 5\sqrt{5} + \sqrt{5}$$
$$= 6\sqrt{5}$$

$$3. 8\sqrt{2} - \sqrt{98}$$
$$= 8\sqrt{2} - \sqrt{49 \cdot 2}$$
$$= 8\sqrt{2} - 7\sqrt{2}$$
$$= \sqrt{2}$$

$$4. 2\sqrt{54} - 3\sqrt{96}$$
$$= 2\sqrt{9 \cdot 6} - 3\sqrt{16 \cdot 6}$$
$$= 2(3)\sqrt{6} - 3(4)\sqrt{6}$$
$$= 6\sqrt{6} - 12\sqrt{6}$$
$$= -6\sqrt{6}$$

Simplify each product.

$$5. \sqrt{3}(\sqrt{5} + \sqrt{3})$$
$$= \sqrt{15} + 3$$

$$6. -\sqrt{8}(2 - 3\sqrt{6})$$
$$= -2\sqrt{8} + 3\sqrt{48}$$
$$= -2\sqrt{4 \cdot 2} + 3\sqrt{16 \cdot 3}$$
$$= -2(2\sqrt{2}) + 3(4\sqrt{3})$$
$$= -4\sqrt{2} + 12\sqrt{3}$$

$$7. (\sqrt{3} + \sqrt{6})(\sqrt{3} - \sqrt{6})$$
$$= \begin{matrix} F & O & I & L \\ 3 & -\sqrt{18} & +\sqrt{18} & -6 \end{matrix}$$
$$= 3 - 6$$
$$= -3$$

$$8. (2\sqrt{2} + \sqrt{5})(2\sqrt{2} - \sqrt{5})$$
$$= \begin{matrix} F & O & I & L \\ 4(2) & -2\sqrt{10} & +2\sqrt{10} & -5 \end{matrix}$$
$$= 8 - 5$$
$$= 3$$

Simplify each quotient.

* Multiply by the conjugate.

$$9. \frac{3}{\sqrt{5}-1} \left(\frac{\sqrt{5}+1}{\sqrt{5}+1} \right)$$

$$= \frac{3\sqrt{5} + 3}{5 + \cancel{\sqrt{5}} - \cancel{\sqrt{5}} - 1}$$

$$= \frac{3\sqrt{5} + 3}{4}$$

$$10. \frac{-1}{9-\sqrt{3}} \left(\frac{9+\sqrt{3}}{9+\sqrt{3}} \right)$$

$$= \frac{-9 - \sqrt{3}}{81 + 9\cancel{\sqrt{3}} - 9\cancel{\sqrt{3}} - 3}$$

$$= \frac{-9 - \sqrt{3}}{78}$$

Simplify each expression.

$$11. 2\sqrt{3}(6 + 2\sqrt{6})$$

$$= 12\sqrt{3} + 4\sqrt{18}$$

$$= 12\sqrt{3} + 4\sqrt{9 \cdot 2}$$

$$= 12\sqrt{3} + 4 \cdot (3)\sqrt{2}$$

$$= 12\sqrt{3} + 12\sqrt{2}$$

$$12. (\sqrt{2} + \sqrt{3})^2$$

$$= (\sqrt{2} + \sqrt{3})(\sqrt{2} + \sqrt{3})$$

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

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