

Multiplying Radicals: Multiply outside number to outside number and inside number to inside number.

Ex. 1 $3\sqrt{2} \cdot 5\sqrt{3}$

$$(3 \cdot 5 \sqrt{2 \cdot 3})$$

$$\boxed{15\sqrt{6}}$$

Ex. 2 $(-2\sqrt{7})(\sqrt{6})$

$$-2 \cdot 1 \sqrt{7 \cdot 6}$$

$$\boxed{-2\sqrt{42}}$$

Adding and Subtracting Radicals: The number inside must be the same (like radicals). Combine the outside numbers and keep the inside number.

Ex. 1 $2\sqrt{5} + 4\sqrt{5}$

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

$$\boxed{6\sqrt{5}}$$

Ex. 2 $6\sqrt{3} + \sqrt{3} - 2\sqrt{3}$

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

$$\boxed{4\sqrt{3} + \sqrt{3}}$$

Simplify the expressions using the proper steps

1. $(3x-2) + (4x+1)$

$$\boxed{7x - 1}$$

2. $(3x-2) - (4x+1)$

$$3x(-2) - 4x(-1)$$

$$\boxed{-x - 3}$$

3. $(3x-2)(4x+1)$

$$12x^2 + 3x - 8x - 2$$

$$\boxed{12x^2 - 5x - 2}$$

List the steps for simplifying the expressions

4. $(3x-2) + (4x+1)$

a. combine like terms

5. $(3x-2) - (4x+1)$

a. distribute the neg.
b. combine like terms

6. $(3x-2)(4x+1)$

a. Distribute (FOIL)
b. combine like terms

Simplify the radical expressions

7. $(3\sqrt{2}-2) + (4\sqrt{2}+1)$

$$\boxed{7\sqrt{2} - 1}$$

8. $(3\sqrt{2}-2) - (4\sqrt{2}+1)$

$$3\sqrt{2}(-2) - 4\sqrt{2}(-1)$$

$$\boxed{-\sqrt{2} - 3}$$

or

$$\boxed{-\sqrt{2} - 3}$$

9. $(3\sqrt{2}-2)(4\sqrt{2}+1)$

$$12\sqrt{4} + 3\sqrt{2} - 8\sqrt{2} - 2$$

$$24 - 5\sqrt{2} - 2$$

$$\boxed{22 - 5\sqrt{2}}$$

A radical is in the simplest form when the radical does not contain any perfect squares

$$\begin{aligned} &\sqrt{50} \\ &\sqrt{25 \cdot 2} \\ &\sqrt{25} \cdot \sqrt{2} \\ &5\sqrt{2} \end{aligned}$$

$$\begin{aligned} &\sqrt{75} \\ &\sqrt{25 \cdot 3} \\ &\sqrt{25} \cdot \sqrt{3} \\ &5\sqrt{3} \end{aligned}$$

$$\begin{aligned} &10. \sqrt{72} \\ &\sqrt{36 \cdot 2} \\ &\downarrow \\ &6\sqrt{2} \end{aligned}$$

$$11. \sqrt{27}$$

$$12. \sqrt{48}$$

Simplify the radicals and then combine like terms

circled problems are HW!

$$13. 3\sqrt{6} - 4\sqrt{6}$$

$$14. 3\sqrt{54} - 4\sqrt{6}$$

$$15. 5\sqrt{8} + 3\sqrt{2}$$

$$16. 3\sqrt{50} + 5\sqrt{8}$$

$$17. 2\sqrt{20} - 3\sqrt{2} - \sqrt{45}$$

$$18. 5\sqrt{45} - 3\sqrt{54}$$

$$\begin{aligned} &3\sqrt{25 \cdot 2} + 5\sqrt{4 \cdot 2} \\ &\downarrow \downarrow \quad \downarrow \downarrow \\ &3 \cdot 5\sqrt{2} + 5 \cdot 2\sqrt{2} \\ &15\sqrt{2} + 10\sqrt{2} \\ &25\sqrt{2} \end{aligned}$$

$$19. (2 - 5\sqrt{3}) - (4 - 4\sqrt{27})$$

$$20. (7 + 8\sqrt{2})(3 - 2\sqrt{6})$$

$$21. (9 - \sqrt{32})(1 + \sqrt{128})$$