

Algebra Lesson 10-3B Operations with Radicals

Objective: Today we will simplify sums and differences of radicals.

Due Next Class: 10-3B p.503 #10, 12, 17-27 odds. **Challenge #29**

Due Today: 10-3A p.503 #1-15 odds, #38

1) $5\sqrt{6}$

11) $-3\sqrt{3}$

3) $-2\sqrt{5}$

13) $-2\sqrt{5}$

5) $14\sqrt{2}$

15) $8\sqrt{10}$

7) yes

38) $5\sqrt{10}$

9) no

Simplify each expression.

1. $-3\sqrt{6} + 8\sqrt{6}$

2. $16\sqrt{10} + 2\sqrt{10}$

3. $\sqrt{5} - 3\sqrt{5}$

4. $6\sqrt{7} - 4\sqrt{7}$

5. $15\sqrt{2} - \sqrt{2}$

6. $-5\sqrt{3} - 3\sqrt{3}$

Tell whether each pair of expressions can be simplified to like radicals.

7. $\sqrt{2}, \sqrt{32}$

8. $\sqrt{3}, \sqrt{75}$

9. $\sqrt{5}, \sqrt{50}$

Simplify each expression.

10. $\sqrt{18} + \sqrt{2}$

11. $2\sqrt{12} - 7\sqrt{3}$

12. $\sqrt{8} + 2\sqrt{2}$

13. $4\sqrt{5} - 2\sqrt{45}$

14. $3\sqrt{7} - \sqrt{28}$

15. $-4\sqrt{10} + 6\sqrt{40}$

$$\sqrt{90} + \sqrt{40}$$

$$\sqrt{9} \cdot \sqrt{10} + \sqrt{4} \cdot \sqrt{10}$$

$$3\sqrt{10} + 2\sqrt{10}$$

$$5\sqrt{10}$$

$$11. 2\sqrt{12} - 7\sqrt{3}$$

$$2\sqrt{4 \cdot 3} - 7\sqrt{3}$$

$$2 \cdot 2\sqrt{3} - 7\sqrt{3}$$

$$4\sqrt{3} - 7\sqrt{3}$$

$$-3\sqrt{3}$$

$$13. 4\sqrt{5} - 2\sqrt{45}$$

$$4\sqrt{5} - 2\sqrt{9 \cdot 5}$$

$$4\sqrt{5} - 2 \cdot 3\sqrt{5}$$

$$4\sqrt{5} - 6\sqrt{5}$$

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

Simplify the radical expression.

$$\sqrt{50} - \sqrt{18}$$

$$\sqrt{25}\sqrt{2} - \sqrt{9}\sqrt{2}$$

$$5\sqrt{2} - 3\sqrt{2}$$

$$\boxed{2\sqrt{2}}$$

$1^2 = 1$
$2^2 = 4$
$3^2 = 9$
$4^2 = 16$
$5^2 = 25$
$6^2 = 36$
$7^2 = 49$
$8^2 = 64$
$9^2 = 81$
$10^2 = 100$
$11^2 = 121$
$12^2 = 144$

$$\sqrt{5}(2 + \sqrt{10})$$

$$\cancel{\sqrt{10}}$$

$$2\sqrt{5} + \sqrt{50}$$

$$2\sqrt{5} + \sqrt{25 \cdot 2}$$

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

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

$$-3\sqrt{18} - 3\sqrt{9}$$

$$-3\sqrt{9 \cdot 2} - 3 \cdot 3$$

$$-3 \cdot 3\sqrt{2} - 9$$

$$\boxed{-9\sqrt{2} - 9}$$

$$(\sqrt{5} - 2\sqrt{15})(\sqrt{5} + \sqrt{15})$$

F O I L

$$\begin{array}{l} \sqrt{5} \cdot \sqrt{5} + \sqrt{5} \cdot \sqrt{15} - 2\sqrt{15} \cdot \sqrt{5} - 2\sqrt{15} \sqrt{15} \\ \sqrt{25} \qquad \qquad \sqrt{75} \qquad -2\sqrt{75} \qquad -2\sqrt{225} \\ \sqrt{25 \cdot 1} \qquad \sqrt{25 \cdot 3} \qquad -2 \cdot 5\sqrt{3} \qquad -2 \cdot 15 \\ 5 + 5\sqrt{3} - 10\sqrt{3} - 30 \end{array}$$

$$5 + 5\sqrt{3} - 10\sqrt{3}$$

$$-30$$

$$\boxed{-25 - 5\sqrt{3}}$$

Simplify each expression.

10. $\sqrt{18} + \sqrt{2}$

12. $\sqrt{8} + 2\sqrt{2}$

14. $3\sqrt{7} - \sqrt{28}$

16. $\sqrt{2}(\sqrt{8} - 4)$

18. $2\sqrt{3}(\sqrt{3} - 1)$

20. $\sqrt{2}(3 + 3\sqrt{2})$

22. $(3\sqrt{2} + \sqrt{3})(\sqrt{2} - 5\sqrt{3})$

24. $(\sqrt{7} - 2)^2$

26. $(2\sqrt{11} + 5)(\sqrt{11} + 2)$

11. $2\sqrt{12} - 7\sqrt{3}$

13. $4\sqrt{5} - 2\sqrt{45}$

15. $-4\sqrt{10} + 6\sqrt{40}$

17. $\sqrt{3}(\sqrt{27} + 1)$

19. $\sqrt{3}(\sqrt{15} + 2)$

21. $\sqrt{6}(\sqrt{6} - 5)$

23. $(2\sqrt{5} - \sqrt{6})(4\sqrt{5} - 3\sqrt{6})$

25. $(2\sqrt{10} + \sqrt{3})^2$

27. $(4 - \sqrt{13})(9 + \sqrt{13})$