HW A.2.7: 1-29 EOO, 31, 37, 41, 43

Simplify each expression.

1. $(3 + \sqrt{7})(3 - \sqrt{7})$ **2.** $(5 + \sqrt{2})(5 - \sqrt{2})$ **3.** $(\sqrt{7} + 1)^2$

4. $(\sqrt{5} + 2)^2$ **5.** $(1 + \sqrt{2})(3 + \sqrt{2})$ **6.** $(6 - \sqrt{3})(4 + \sqrt{3})$

7. $\dfrac{1}{4 - \sqrt{3}}$ **8.** $\dfrac{1}{6 + \sqrt{3}}$ **9.** $(\sqrt{7} - \sqrt{2})^2$

10. $(3\sqrt{11} - \sqrt{10})^2$ **11.** $(3 + 4\sqrt{3})(2 - \sqrt{3})$ **12.** $(5 - \sqrt{2})(3 - 2\sqrt{2})$

13. $\dfrac{3}{\sqrt{5} + \sqrt{2}}$ **14.** $\dfrac{10}{2\sqrt{3} - \sqrt{7}}$

15. $(\sqrt{11} - \sqrt{7})(\sqrt{11} + \sqrt{7})$ **16.** $(\sqrt{13} - \sqrt{3})(\sqrt{13} + \sqrt{3})$

17. $(5 + \sqrt{3})(8 - 2\sqrt{3})$ **18.** $(3 + 2\sqrt{6})(4 - 5\sqrt{6})$

19. $\dfrac{\sqrt{15}}{\sqrt{3} + \sqrt{5}}$ **20.** $\dfrac{\sqrt{6}}{\sqrt{2} + \sqrt{3}}$

21. $(2\sqrt{5} + \sqrt{7})^2$ **22.** $(3\sqrt{2} + \sqrt{6})^2$

23. $(2\sqrt{3} + \sqrt{5})(2\sqrt{3} - \sqrt{5})$ **24.** $(3\sqrt{7} - 2\sqrt{5})(3\sqrt{7} + 2\sqrt{5})$

25. $(\sqrt{6} - \sqrt{15})^2$ **26.** $(2\sqrt{5} - \sqrt{10})^2$

27. $\dfrac{\sqrt{5} + \sqrt{3}}{2} \cdot \dfrac{\sqrt{5} - \sqrt{3}}{2}$ **28.** $\dfrac{2\sqrt{7} + 1}{3} \cdot \dfrac{2\sqrt{7} - 1}{3}$

29. $(5\sqrt{6} + 3\sqrt{2})(2\sqrt{6} - 4\sqrt{3})$ **30.** $(3\sqrt{5} + 2\sqrt{15})(4\sqrt{3} - 3\sqrt{15})$

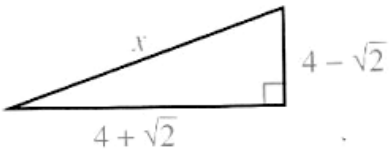
31. $\dfrac{\sqrt{5} + 1}{\sqrt{5} - 3}$ **32.** $\dfrac{2\sqrt{7} - \sqrt{3}}{\sqrt{7} + \sqrt{3}}$

37. a. What is the conjugate of $2\sqrt{5} - 3\sqrt{2}$?
b. What is the reciprocal of the conjugate of $2\sqrt{5} - 3\sqrt{2}$?
c. What is the conjugate of the reciprocal of $2\sqrt{5} - 3\sqrt{2}$?

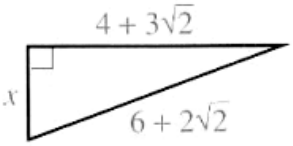
38. Show that the reciprocal of $\dfrac{\sqrt{5} + 1}{2}$ is also the conjugate of $\dfrac{\sqrt{5} + 1}{2}$.

Use the Pythagorean theorem to find x.

39.



40.



Simplify. Assume that each radical represents a real number.

41. $(\sqrt{n + 1} + \sqrt{n})(\sqrt{n + 1} - \sqrt{n})$ **42.** $(b + \sqrt{b})^2 - (b - \sqrt{b})^2$

43. $\dfrac{\sqrt{w}}{\sqrt{w} + 1} + \dfrac{\sqrt{w}}{\sqrt{w} - 1}$ **44.** $\sqrt{1 - y^2} + \dfrac{y^2}{\sqrt{1 - y^2}}$