



Name: \_\_\_\_\_ Period: \_\_\_\_\_

**2.3 Simplifying Radicals Multiplying, Adding, and Subtracting Radicals 2019-2020  
(1.1.1 and 1.2.1)**

**Simplify. Write your answers in simplest radical form.**

1.  $\sqrt{81}$

2.  $\sqrt{16x^6y^8}$

3.  $-\sqrt{18}$

4.  $\sqrt[3]{-125}$

5.  $\sqrt{28x^3y^4}$

6.  $13\sqrt{8}$

7.  $-3\sqrt{75x^5}$

8.  $\sqrt{-8}$

9.  $9xy\sqrt{72x^3y^{14}}$

10.  $x^2y^4z\sqrt[3]{24x^6}$

**Multiply (make sure you simplify).**

11.  $\sqrt{20} \cdot \sqrt{5}$

12.  $\sqrt{6} \cdot \sqrt{2}$

13.  $\sqrt{7} \cdot 3\sqrt{7}$

**Multiply (make sure you simplify).**

14.  $(2\sqrt{3})^2$

15.  $8\sqrt{18y} \cdot 3\sqrt{2y}$

16.  $\sqrt[3]{4} \cdot \sqrt[3]{16}$

17.  $\sqrt[4]{24} \cdot \sqrt[4]{2}$

18.  $\sqrt[3]{x^2y^4} \cdot \sqrt[3]{x^2y^6}$

19.  $2\sqrt[4]{x^3y} \cdot 5\sqrt[4]{x^5y^3}$

**Add or subtract. Simplify by combining like radical terms, if possible.**

20.  $4\sqrt{3} + 7\sqrt{3}$

21.  $10\sqrt{2} + 9\sqrt{3} - 7\sqrt{3} - 15\sqrt{2}$

22.  $\sqrt{12} - \sqrt{3} + \sqrt{48}$

23.  $9\sqrt{18} - 4\sqrt{2}$

24.  $\sqrt{12} + \sqrt{50} - \sqrt{20}$

25.  $\sqrt{27} + 2\sqrt{50} - 5\sqrt{8}$

26.  $\sqrt[3]{3} - \sqrt[3]{24} + \sqrt[3]{27}$

27.  $\sqrt[4]{162} - \sqrt[4]{32} + \sqrt[4]{3}$

### Simplify

28.  $-\sqrt{144}$

29.  $3\sqrt{45} - 8\sqrt{20}$

30.  $\sqrt{15} \cdot 4\sqrt{30}$

31.  $3\sqrt[3]{16} - 2\sqrt[3]{54} + \sqrt[3]{81}$

32.  $-2\sqrt{6} \cdot 7\sqrt{33}$

33.  $(7\sqrt{5})^2$

34.  $4\sqrt[3]{18x} \cdot 2\sqrt[3]{3x^2}$

35.  $4\sqrt{121}$

36.  $7\sqrt[3]{4} - 5\sqrt[3]{4}$

37.  $9\sqrt[3]{7} - \sqrt{7} + 4\sqrt[3]{7} - 2\sqrt{7}$

38.  $-\sqrt[3]{8x^{18}y^6}$

39.  $\sqrt[4]{810x^9}$

### Review

Write an equivalent expression using radical notation, simplify if possible.

40.  $y^{\frac{5}{3}}$

41.  $7x^{5/4}$

42.  $p^{5/6}$

43.  $16^{3/4}$

44.  $8^{\frac{4}{3}}$

**Write an equivalent expression using rational exponents.**

45.  $\sqrt[5]{pq}$

46.  $4\sqrt[3]{x^2}$

**Use the laws of exponents to simplify. Use only positive exponents in your answer.**

47.  $y^{1/4} \cdot y^{-3/4}$

48.  $\frac{x}{\frac{2}{x^5}}$

49.  $(n^{-1/6})^{9/2}$