Bellwork: Simplify the expression

$$\left(x^{\frac{3}{2}}\right)\left(x^{\frac{1}{2}}\right) = x^{3/2+1/2} = x^{4/2}$$

$$\boxed{x^2}$$

17) $64^{3/4}$ $\quad \left(\sqrt[4]{64}\right)^3 \quad \left(2\sqrt[4]{2^2}\right)^3$

8 8

4 2 4 2

2 2 2 2

$\left(2^3\sqrt[4]{2^6}\right)$

$2^3 \cdot 2\sqrt[4]{2^2}$

$16\sqrt[4]{4}$

22) $\left(n^{-2/3}\right)^{6/1} = n^{-12/3} = n^{-4}$

$$\boxed{= \frac{1}{n^4}}$$

Homework Solutions

1. $3\sqrt{10}$
2. 8
3. 3
4. $9\sqrt{2}$
5. $6\sqrt{22}$
6. $12\sqrt{2}$
7. $2\sqrt[3]{25}$
8. $p^6\sqrt{p}$
9. $q^3\sqrt[4]{q^3}$
10. c^7
11. $10xy^3\sqrt{x}$
12. $4x^7$
13. $8b^2c^5\sqrt{7abc}$
14. $2xyz^3\sqrt[3]{7x^2z}$
15. 9
16. 729
17. $16\sqrt[4]{4}$
18. $x^2y\sqrt[5]{x^2y}$
19. $250a^3bc^7\sqrt{2bc}$
20. $x^2\sqrt[3]{x}$
21. a
22. $\dfrac{1}{n^4}$
23. $\dfrac{9a^2b^4}{c^{10}}$
24. $\dfrac{2x^5y^{10}}{3}$
25. $120x^7$

★ 26. $x^2\sqrt[24]{x^2}$

OBJECTIVE

1. I can add, subtract, and multiply radical expressions

Adding or subtracting radicals is like adding and subtracting like terms. The "like" part in this case is the radical, which must match in both index and radicand to be "like".

$$2\sqrt{3} + 7\sqrt{3} = 9\sqrt{3} \qquad 6\sqrt[3]{7} - 1\sqrt[3]{7} = 5\sqrt[3]{7}$$

$2x + 7x = 9x$

Example 1

$$1\sqrt[2]{5}+8\sqrt[2]{5} = 9\sqrt{5}$$

Example 2

$$5\sqrt{6}-8\sqrt{7}+11\sqrt{6}$$

$$16\sqrt{6} - 8\sqrt{7}$$

Sometimes you will need to simplify to obtain "like" terms

$$\sqrt{75} + \sqrt{27}$$

Example 3

$$1\sqrt[2]{18} + 2\sqrt{50}$$

9 2 25 2

3 3 5 5

$$3\sqrt{2} + 2 \cdot 5\sqrt{2}$$

$$3\sqrt{2} + 10\sqrt{2} = \boxed{13\sqrt{2}}$$

Example 4

$$\sqrt{75} - \sqrt{12}$$

25 3   6 2

5 5   2 3

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

$= 3\sqrt{3}$

Multiplying radicals does not require like terms. You can multiply the radicands as long as the indexes match.

$$\left(\sqrt{5}\right)\left(\sqrt{3}\right) = \sqrt{15} \qquad \left(2\sqrt[4]{7}\right)\left(10\sqrt[4]{6}\right) = 20\sqrt[4]{42}$$

Example 5

$$\left(4\sqrt{10}\right)\left(3\sqrt{6}\right)$$

$12\sqrt{60}$

60

30 $\boxed{2}$

3 10

5 $\boxed{2}$

$12\cdot 2\sqrt{3\cdot 5}$

$24\sqrt{15}$

Example 6

$$\left(5-2\sqrt{3}\right)\left(4+\sqrt{3}\right)$$

	5	$-2\sqrt{3}$
4	20	$-8\sqrt{3}$
$+\sqrt{3}$	$5\sqrt{3}$	$-2\sqrt{3}^2$

$-2(3)$

-6

$20 - 3\sqrt{3} - 6$

$14 - 3\sqrt{3}$