

Multiplying Radical Expressions

Simplify.

1) $3\sqrt{12} \cdot \sqrt{6}$

$$3\sqrt{72}$$

$$3\sqrt{9 \cdot 8}$$

$$3 \cdot 3\sqrt{8}$$

$$9\sqrt{8} = 9\sqrt{4 \cdot 2} = \boxed{18\sqrt{2}}$$

$$y = \frac{72}{x}$$

x	y
1	72
2	36

2) $\sqrt{5} \cdot \sqrt{10}$

$$\sqrt{50}$$
$$\sqrt{25 \cdot 2}$$
$$\boxed{5\sqrt{2}}$$

$$y = \frac{50}{x}$$

x	y
1	50
2	25

5) $-4\sqrt{15} \cdot \sqrt{3}$

$$-4\sqrt{45}$$

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

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

$$\boxed{-12\sqrt{5}}$$

$$y = \frac{45}{x}$$

6) $\sqrt{20x^2} \cdot \sqrt{20x^3}$

$$\sqrt{400x^5}$$
$$\boxed{20x\sqrt{x}}$$

$x \cdot x \cdot x$

9) $-3\sqrt{7r^3} \cdot 6\sqrt{7r^2}$

$$-18\sqrt{49r^5}$$

$$-18 \cdot 7r^2\sqrt{r}$$

$$\boxed{-126r^2\sqrt{r}}$$

10) $-4\sqrt{28x} \cdot \sqrt{7x^3}$

$$-4\sqrt{196x^4}$$

$$-4 \cdot 7x^2$$

$$\boxed{-56x^2}$$

$$y = 196$$

13) $-3\sqrt{3}(2 + \sqrt{6})$

$$-6\sqrt{3} - 3\sqrt{18}$$

$$-6\sqrt{3} - 3\sqrt{9 \cdot 2}$$

$$-6\sqrt{3} - 3 \cdot 3\sqrt{2}$$

$$\boxed{-6\sqrt{3} - 9\sqrt{2}}$$

14) $\sqrt{3}(-5\sqrt{10} + \sqrt{6})$

$$-5\sqrt{30} + \sqrt{18}$$

$$-5\sqrt{30} + \sqrt{9 \cdot 2}$$

$$\boxed{-5\sqrt{30} + 3\sqrt{2}}$$

$$17) \sqrt{14x(3-\sqrt{2x})}$$

$$3\sqrt{14x} - \sqrt{28x^2}$$

$$3\sqrt{14x} - \sqrt{7 \cdot 4 \cdot (xx)}$$

$$\boxed{3\sqrt{14x} - 2x\sqrt{7}}$$

$$18) \sqrt{6n(7n^2 + \sqrt{12})}$$

$$21) (-2\sqrt{3} + 2)(\sqrt{3} - 5)$$

$$22) (5 - 4\sqrt{5})(-2 + \sqrt{5})$$

$\sqrt{5}^2$

$$-10 + 5\sqrt{5} + 8\sqrt{5} - 4(5)$$

$$-10 + 5\sqrt{5} + 8\sqrt{5} - 20$$

$$\boxed{13\sqrt{5} - 30}$$

$$\sqrt{x^2} = x$$

$$\sqrt{x^5} = x^2\sqrt{x}$$

$$\sqrt{x^3} = x\sqrt{x}$$

$$\sqrt{x^6} = x^3$$

$$\sqrt{x^4} = x^2$$

$$\sqrt{x^7} = x^3\sqrt{x}$$

$$\sqrt{x^8} = x^4$$