

Radical Review and Factoring Review

Simplify.

$$1) \sqrt{18x^4y^3}$$

$$\boxed{3x^2y\sqrt{2y}}$$

$$2) \sqrt[3]{-135x^2}$$

$$\boxed{-3\sqrt[3]{5x^2}}$$

$$\begin{array}{r} 135 \\ 5 \ 27 \\ \quad 9 \ 3 \\ \quad \quad 33 \end{array}$$

$$3) \sqrt[4]{96x^2y^5}$$

$$\boxed{2y\sqrt[4]{6x^2y}}$$

$$\begin{array}{r} 96 \\ 16 \ 6 \\ 2222 \ 23 \end{array}$$

$$4) -3\sqrt{20} + 2\sqrt{45}$$

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

$$\boxed{0}$$

$$5) 2\sqrt{6} - 2\sqrt{54} - 2\sqrt{20}$$

$$2\sqrt{6} - 6\sqrt{6} - 4\sqrt{5}$$

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

$$6) 2\sqrt{15}(\sqrt{2} + \sqrt{6})$$

$$2\sqrt{30} + 2\sqrt{90}$$

$$\boxed{2\sqrt{30} + 6\sqrt{10}}$$

$$7) (4 + 2\sqrt{5})(5 + 4\sqrt{5})$$

$$20 + 16\sqrt{5} + 10\sqrt{5} + 40$$

$$\boxed{60 + 26\sqrt{5}}$$

$$8) (\sqrt{2} + 1)(\sqrt{2} + 1)$$

$$2 + \sqrt{2} + \sqrt{2} + 1$$

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

$$9) \frac{\sqrt{3}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{3}} = \boxed{\frac{\sqrt{15}}{5}}$$

$$10) \frac{\sqrt{5} + \sqrt{2}}{\sqrt{11}} \cdot \frac{\sqrt{11}}{\sqrt{11}} = \boxed{\frac{\sqrt{55} + \sqrt{22}}{11}}$$

$$11) \frac{4}{2+\sqrt{5}} \cdot \frac{2-\sqrt{5}}{2-\sqrt{5}} = \frac{8-4\sqrt{5}}{4-2\sqrt{5}+2\sqrt{5}-5}$$

$$\frac{8-4\sqrt{5}}{-1} = \boxed{-8+4\sqrt{5}}$$

$$12) \frac{2}{2-\sqrt{2}} \cdot \frac{2+\sqrt{2}}{2+\sqrt{2}} = \frac{4+2\sqrt{2}}{4+2\sqrt{2}-2\sqrt{2}-2}$$

$$\frac{4+2\sqrt{2}}{2} = \boxed{2+\sqrt{2}}$$

$$13) \frac{\sqrt[3]{5}}{\sqrt[3]{3}} \cdot \frac{\sqrt[3]{3 \cdot 3}}{\sqrt[3]{3 \cdot 3}} = \boxed{\frac{\sqrt[3]{45}}{3}}$$

$$14) \frac{4}{\sqrt[3]{4}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}} = \frac{4\sqrt[3]{2}}{2} = \boxed{2\sqrt[3]{2}}$$

Factor each completely.

$$15) 4p^2 - 16p - 20$$

$$4(p^2 - 4p - 5)$$

$$\boxed{4(p-5)(p+1)}$$

$$16) p^2 - 3p - 28$$

$$\boxed{(p-7)(p+4)}$$

$$17) 10n^2 - 2n - 36$$

$$2(5n^2 - n - 18)$$

$$5n^2 - 10n + 9n - 18$$

$$5n(n-2) + 9(n-2)$$

$$\boxed{2(5n+9)(n-2)}$$

$$18) 2x^2 - 11x + 12$$

$$2x^2 - 8x - 3x + 12$$

$$2x(x-4) - 3(x-4)$$

$$\boxed{(2x-3)(x-4)}$$

$$19) 35n^3 - 14n^2 - 10n + 4$$

$$7n^2(5n-2) - 2(5n-2)$$

$$\boxed{(7n^2-2)(5n-2)}$$

$$20) 5x^3 - 15x^2 - 4x + 12$$

$$5x^2(x-3) - 4(x-3)$$

$$\boxed{(5x^2-4)(x-3)}$$

$$21) 25n^2 - 9$$

$$\boxed{(5n+3)(5n-3)}$$

$$22) 4a^2 - 9$$

$$\boxed{(2a+3)(2a-3)}$$