

$$4. (x^3)^{-\frac{1}{2}} x^3$$

$$x^{-\frac{3}{2}} x^3$$

$$x^{\frac{3}{2}}$$

$$5. \frac{10x^2}{15x}$$

$$\frac{2}{3} x^{-3}$$

$$\frac{2}{3} x^3$$

$$6. (3x^2 - 1)(4x^2 - 1)$$

$$(3x^2 - 1)(4)(x^2 - \frac{1}{4})$$

$$(3x^2 - 1)(16x^4 - 1)$$

$$48x^6 - 4$$

$$7. \sqrt{\sqrt{4x^2}} = ((x^{\frac{2}{4}})^{\frac{1}{2}})^{\frac{1}{2}} = x^{\frac{1}{8}}$$

$$11. f(x) = \sqrt{12-4x}$$

$$-12 - 4x \geq 0$$

$$\frac{-4x}{-4} \geq \frac{-12}{-4}$$

$$x \leq 3$$

$$12. \frac{\sqrt[4]{5}}{\sqrt{16}} = \frac{\sqrt[4]{5}}{\sqrt[4]{16}} = \frac{\sqrt[4]{5}}{2}$$

$$13. \frac{\sqrt[3]{6x^5}}{y^2} = \frac{\sqrt[3]{16} \sqrt[3]{x^5}}{y^{\frac{4}{3}}} = \frac{\sqrt[3]{8} \sqrt[3]{2} x \sqrt[3]{x^2}}{y^{\frac{4}{3}}}$$

$$= \frac{2x \sqrt[3]{2x^2}}{y^{\frac{4}{3}}}$$

$$14. \sqrt{\frac{40x^7}{9y^{11}}} = \frac{\sqrt{40} \sqrt{x^7}}{\sqrt{9} \sqrt{y^{11}}}$$

$$= \frac{\sqrt{4} \sqrt{10} x^3 \sqrt{x}}{3y^5 \sqrt{y}}$$

$$= \frac{2x^3 \sqrt{10x} \cdot \sqrt{y}}{3y^5 \sqrt{y} \cdot \sqrt{y}}$$

$$= \frac{2x^3 \sqrt{10xy}}{3y^6}$$

$$\begin{aligned}
 &86. \sqrt{125} + \sqrt{45} \\
 &\quad \sqrt{25 \cdot 5} + \sqrt{9 \cdot 5} \\
 &5\sqrt{5} + 3\sqrt{5} \\
 &8\sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 \text{Ex: } &3\sqrt{8x} - 2\sqrt{32x} \\
 &3\sqrt{8}\sqrt{x} - 2\sqrt{32}\sqrt{x} \\
 &3\sqrt{4 \cdot 2}\sqrt{x} - 2 \cdot \sqrt{16 \cdot 2}\sqrt{x} \\
 &3 \cdot 2 \cdot \sqrt{2x} - 2 \cdot 4 \sqrt{2x} \\
 &\underline{6\sqrt{2x}} - \underline{8\sqrt{2x}} \\
 &\quad \textcircled{-2\sqrt{2x}}
 \end{aligned}$$

5.4 Multiplying + Dividing Radicals

$$\sqrt{a} \cdot \sqrt{b} = \sqrt{a \cdot b}$$

Ex: $\sqrt{11} (\sqrt{5} - 3)$

$$\sqrt{55} - 3\sqrt{11}$$

Ex: $(\sqrt{5} + 3)(\sqrt{10} - 5)$

$$\sqrt{50} - 5\sqrt{5} + 3\sqrt{10} - 15$$

$$\sqrt{25} \sqrt{2} - 5\sqrt{5} + 3\sqrt{10} - 15$$

$$5\sqrt{2} - 5\sqrt{5} + 3\sqrt{10} - 15$$

Dividing

$$\frac{3x \sqrt{18x^3}}{3x}$$

→ →

$$\frac{3x}{3x} - \frac{\sqrt{18x^3}}{3x} \sqrt{1}$$

$$1 - \frac{\sqrt{9 \cdot 2} \cdot x \sqrt{x}}{3x}$$

$$1 - \frac{3 \sqrt{2} x}{3x}$$

$$1 - \sqrt{2}$$

conjugate

$$a + b \rightarrow a - b$$

Ex: Find the conjugate of

$$3 + \sqrt{41} \rightarrow (3 - \sqrt{41})$$

Rationalize

Ex: $\frac{5}{(3-\sqrt{6})(3+\sqrt{6})}$

$$\frac{15 + 5\sqrt{6}}{9 + \cancel{3\sqrt{6}} - \cancel{3\sqrt{6}} - \sqrt{36}}$$

$$\frac{15 + 5\sqrt{6}}{9 - 6}$$

$$\frac{15 + 5\sqrt{6}}{3}$$

$$\frac{15 + 5\sqrt{6}}{3}$$

$$\frac{15 + 5\sqrt{6}}{3}$$

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2-76 even,

skip 34-38