Radicals – Formula Sheet:

Radical Addition:

$$a\sqrt[n]{x} + b\sqrt[n]{x} = (a+b)\sqrt[n]{x}$$

Radical Multiplication:

$$\sqrt[n]{x} \cdot \sqrt[n]{y} = \sqrt[n]{xy}$$

Radical Division:

$$\frac{\sqrt[n]{x}}{\sqrt[n]{y}} = \sqrt[n]{\frac{x}{y}}$$

Radical to Exponent:

$$\sqrt[n]{x} = x^{1/n}$$

$$\sqrt[n]{x^m} = x^{m/n}$$

Radical Exponentiation:

$$\left(\sqrt[n]{x}\right)^m = \sqrt[n]{x^m}$$

Radical Indexation:

$$\sqrt[m]{\sqrt[n]{x}} = \sqrt[mn]{x}$$

Radicals and Absolute Value:

$$\sqrt[n]{x^n} = x \qquad if\ \boldsymbol{n}\ is\ odd$$

$$\sqrt[n]{x^n} = |x| \qquad if\ \boldsymbol{n}\ is\ even$$

Multiplying Radicals with Different Indices:

$$\sqrt[m]{x^a} \cdot \sqrt[n]{x^b} = \sqrt[mn]{x^{an+bm}}$$