

UNIT 6 – DAY 1 NOTES
REVIEW

SIMPLIFYING RADICALS

Simplifying Radicals:

- 1) Look for perfect squares. (for example: 1, 4, 9, 16, 25, 36, etc.)
- 2) Rewrite as a product of a perfect square and another number.
- 3) Take the square root of the perfect square and bring outside the square root. Make sure to multiply it by any coefficients already outside the square root.

$$1) \sqrt{144}$$

$$\textcircled{12}$$

$$2) \sqrt{12}$$

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

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

$$3) 2\sqrt{32}$$

$$2\sqrt{16 \cdot 2}$$

$$2 \cdot 4\sqrt{2}$$

$$\boxed{8\sqrt{2}}$$

$$4) \sqrt{196} = \textcircled{14}$$

$$5) \sqrt{18}$$

$$\sqrt{9 \cdot 2}$$

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

$$6) 5\sqrt{54}$$

$$5\sqrt{9 \cdot 6}$$

$$5 \cdot 3\sqrt{6}$$

$$\boxed{15\sqrt{6}}$$

Multiplying Radicals

Steps:

1. Multiply coefficients
2. Multiply Radicands (# under square root)
3. Simplify as we did above

$$1) \sqrt{4} \times \sqrt{3}$$

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

$$2) 2\sqrt{7} \times 3\sqrt{5}$$

$$\boxed{6\sqrt{35}}$$

$$3) \sqrt{3}(\sqrt{10} + \sqrt{15})$$

$$\sqrt{30} + \sqrt{45}$$

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

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

$$4) \sqrt{8} \cdot \sqrt{6}$$

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

$$2\sqrt{12}$$

$$2\sqrt{4 \cdot 3}$$

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

$$\boxed{4\sqrt{3}}$$

$$5) 2\sqrt{10} \cdot 3\sqrt{5}$$

$$6\sqrt{50}$$

$$6\sqrt{25 \cdot 2}$$

$$6 \cdot 5\sqrt{2}$$

$$\boxed{30\sqrt{2}}$$

$$6) -3\sqrt{2}(4\sqrt{6} - 5\sqrt{18})$$

$$-12\sqrt{12} + 15\sqrt{36}$$

$$-12 \cdot 2\sqrt{3} + 15 \cdot 6$$

$$\boxed{-24\sqrt{3} + 90}$$

Dividing Radicals

Steps:

1. Divide/reduce coefficients (numbers outside radical)
2. Divide/reduce radicands (numbers inside radical)
3. Rationalize denominator if needed
4. Simplify!

$$1) \frac{2\sqrt{15}}{\sqrt{3}} = 2\sqrt{\frac{15}{3}} = \boxed{2\sqrt{5}}$$

$$2) \frac{3\sqrt{10}}{2\sqrt{5}} = 3\sqrt{\frac{10}{5}} = \boxed{3\sqrt{2}}$$

$$3) \frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \boxed{\sqrt{3}}$$

$$4) \frac{4\sqrt{3}}{8\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{4\sqrt{3}}{3}}$$

$$5) \frac{7\sqrt{16}}{2\sqrt{2}} = 7\sqrt{\frac{16}{2}} = 7\sqrt{8} = 7 \cdot 2\sqrt{2} = \boxed{14\sqrt{2}}$$

$$6) \frac{4}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{2}}{2} = \boxed{2\sqrt{2}}$$

Add/Subtract Radicals

Steps:

1. Simplify each radical
2. Add/subtract like terms

$$1) 3x + 4x = 3\sqrt{2} + 4\sqrt{2} = \boxed{7\sqrt{2}}$$

$$2) \underline{3\sqrt{7}} + 2\sqrt{3} + \underline{8\sqrt{7}} = 11\sqrt{7} + 2\sqrt{3}$$

$$3) 2\sqrt{6} - 5\sqrt{54} = 2\sqrt{6} - 5\sqrt{9\sqrt{6}} = 2\sqrt{6} - 5 \cdot 3\sqrt{6} = 2\sqrt{6} - 15\sqrt{6} = \boxed{-13\sqrt{6}}$$

$$4) \sqrt{7} - 8\sqrt{7} = \boxed{-7\sqrt{7}}$$

$$5) 3\sqrt{5} - 4\sqrt{2} + 5\sqrt{2} = \boxed{3\sqrt{5} + 1\sqrt{2}}$$

$$6) 3\sqrt{24} - 5\sqrt{6} + 4\sqrt{20} = 3 \cdot 2\sqrt{6} - 5\sqrt{6} + 4 \cdot 2\sqrt{5} = 6\sqrt{6} - 5\sqrt{6} + 8\sqrt{5} = \boxed{1\sqrt{6} + 8\sqrt{5}}$$