Algebra II
Simplifying, Adding and Subtracting Radicals Notes
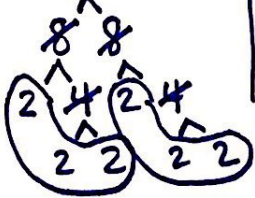
Name: _____

_____

Simplifying Radicals
- Find the prime factorization of the radicand
- Look for the "twins" or factors that are the same
- Remove one "twin" or factor for each pair
- Leave any "singles" or single factors under the radical

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Directions: Simplify the following:

1) $\sqrt[2]{x^5}$ $\quad$ (x·x)(x·x)·x

$$X^2 \sqrt{X}$$

2) $\sqrt[3]{-64a^6b^3}$

$$-4a^2b$$

3) $\sqrt{63dm^7}$

4) $\sqrt{300r^5}$

5) $\sqrt[4]{625n^8m^4}$

25 25

5 5 5 5

$$5n^2m$$

6) $6\sqrt[2]{40x^2y^7}$ $\quad$ (x·x)

4 10

2 2 2 5

$$12xy^3\sqrt{10y}$$

$(y·y)(y·y)(y·y)y$

7) $\sqrt{84mh^{15}}$

8) $n\sqrt{84m^4}$

9) $2\sqrt{25x^{20}}$

10) $-7\sqrt{54x^{11}}$

9 6

3 3 2 3
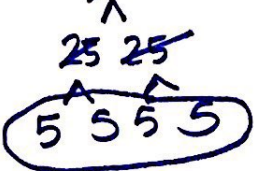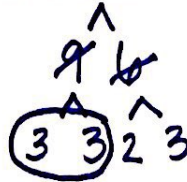
$$-21x^5\sqrt{6x}$$

Like Radicals: radicals with same index & same radicand (what's under radical)

Ex: Add or Subtract.

11) $5\sqrt[3]{x} - 3\sqrt[3]{x}$

$$\boxed{2\sqrt[3]{x}}$$

12) $4\sqrt{2} + 5\sqrt{3}$

$$\boxed{\text{Simplified}}$$

13) $\sqrt{50} + 3\sqrt{32} - 5\sqrt{18}$

$$5\sqrt{2} + 12\sqrt{2} - 15\sqrt{2}$$
$$\boxed{2\sqrt{2}}$$

14) $-3\sqrt{5} + 5\sqrt{2} + 4\sqrt{20} - 3\sqrt{50}$

15) $8\sqrt{3} - 3\sqrt{75}$

16) $\sqrt[3]{48} - \sqrt[3]{6}$

17) $\sqrt[4]{y^4} + \sqrt[3]{y^6} + \sqrt{y^8}$

$$\boxed{y + y^2 + y^4}$$

18) Casey hit a foul-ball straight up over the plate. It reached a height of 112 feet, how long does the catcher have to get ready to catch the ball before it reaches the ground? The formula for the total time is $t = 2\sqrt{\dfrac{2h}{g}}$, where h is the height of the ball and g is the acceleration due to gravity. Assume that the acceleration due to gravity is 32 feet per second squared.

$$t = 2\sqrt{\frac{2h}{g}}$$
$$t = 2\sqrt{\frac{2(112)}{32}}$$
$$t = 2\sqrt{7}$$

$$t = \boxed{5.3 \text{ sec}}$$