Algebra 1
Simplifying Radicals Notes: Day 1

Name: Key

Warm Up: Evaluate the following square roots without a calculator.

$$\sqrt{a}$$

$\sqrt{1} = 1$ $\sqrt{4} = 2$ $\sqrt{9} = 3$ $\sqrt{16} = 4$

$\sqrt{25} = 5$ $\sqrt{36} = 6$ $\sqrt{49} = 7$ $\sqrt{64} = 8$

$\sqrt{81} = 9$ $\sqrt{100} = 10$ $\sqrt{121} = 11$ $\sqrt{144} = 12$

1) $\sqrt{x^2} = x$

$\sqrt{x^4} = x^2$

$\sqrt{x^6} = x^3$

*exponent divided by 2

2) $\sqrt{100} + \sqrt{36}$

$10 + 6 = 16$

3) $4\sqrt{9}$

$4 \cdot 3$

12

4) $\sqrt{\frac{1}{4}}$

$\frac{\sqrt{1}}{\sqrt{4}} = \frac{1}{2}$

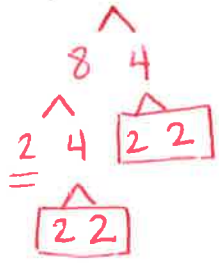
* For every pair one comes out

Use a factor tree to simplify. Your answer should be in simplest radical form.

1.) $\sqrt{20}$

$2\sqrt{5}$

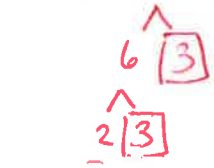
2.) $\sqrt{32}$



$2 \cdot 2\sqrt{2}$

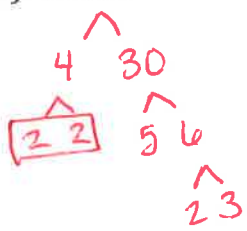
$4\sqrt{2}$

3.) $\sqrt{18}$



$3\sqrt{2}$

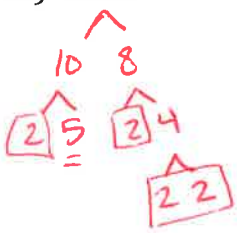
4.) $\sqrt{120}$



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

$2\sqrt{30}$

5.) $\sqrt{80}$



$2 \cdot 2\sqrt{5}$

$4\sqrt{5}$

6) $2\sqrt{27}$

$2 \cdot 3\sqrt{3}$

$6\sqrt{3}$

7) $-5\sqrt{40}$

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

$-10\sqrt{10}$

8) $\sqrt{36x^2}$

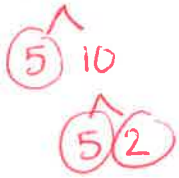
$6x$

9) $\sqrt{100x^6}$

$10x^3$

Try it!

10.) $\sqrt{50}$



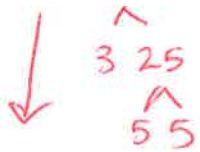
$5\sqrt{2}$

11.) $-2\sqrt{60}$

$-2 \cdot 2\sqrt{3 \cdot 5}$

$-4\sqrt{15}$

12.) $3\sqrt{75}$



$3 \cdot 5\sqrt{3}$

$15\sqrt{3}$

KEYSTONE PROBLEMS

1. Which value of x makes the expression $3\sqrt{53x}$ equivalent to $21\sqrt{53}$?

A.) 147 C.) 7

B.) 441 D.) 49

$\cdot 7$

$7^2 = 49$

2. The expression $\sqrt{85x}$ should be further simplified for which value of x?

A.) 59 C.) 3

B.) 94 D.) 235

$\sqrt{85}$

$5 \cdot 17$

3. Simplify the following: $\dfrac{7\sqrt{12}+6\sqrt{108}}{\sqrt{2}}$

$\dfrac{7\sqrt{12}}{\sqrt{2}} + \dfrac{6\sqrt{108}}{\sqrt{2}}$

$7\sqrt{6} + 6\sqrt{54}$

$\sqrt{54}$

$6 \cdot 9$

$2 \cdot 3 \cdot 3 \cdot 3$

$7\sqrt{6} + 6 \cdot 3\sqrt{6}$

$7\sqrt{6} + 18\sqrt{6} = 25\sqrt{6}$

Try it!

4. Which value of x makes the expression $2\sqrt{51x}$ equivalent to $10\sqrt{51}$?

A.) 5 C.) 25

B.) 50 D.) 100

$\cdot 5$

$5^2 = 25$

5. The expression $\sqrt{87x}$ should be further simplified for which value of x?

A.) 10 C.) 13

B.) 39 D.) 38

$\sqrt{87}$

$3 \cdot 29$