Name: _____ **Date**_____ **#44 Simplify Radicals**

Estimate each value. ← I did not use a calculator for mine. Whether you use one or not, it should be close

Then, simplify each radical. (Remember you can rewrite as ½ power if that makes it easier for you).

1. $\sqrt{12} = 2\sqrt{3}$ ≈ 3.45

$\sqrt{4 \cdot 3}$

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

2. $\sqrt{18} = 3\sqrt{2}$ ≈ 4.2

$\sqrt{9 \cdot 2}$

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

3. $\sqrt{48} = 4\sqrt{3}$ ≈ 6.95

$\sqrt{16 \cdot 3}$

$\sqrt{16} \cdot \sqrt{3}$

4. $\sqrt{8} = 2\sqrt{2}$ ≈ 2.8

$\sqrt{4 \cdot 2}$

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

5. $\sqrt{32} = 4\sqrt{2}$ ≈ 5.8

$\sqrt{16 \cdot 2}$

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

6. $\sqrt{75} = 5\sqrt{3}$ ≈ 8.6

$\sqrt{25 \cdot 3}$

$\sqrt{25} \cdot \sqrt{3}$

7. $\sqrt{112} = 4\sqrt{7}$ ≈ 10.6

$\sqrt{16 \cdot 7}$

$\sqrt{16} \cdot \sqrt{7}$

8. $\sqrt{150} = 5\sqrt{6}$ ≈ 12.24

$\sqrt{25 \cdot 6}$

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

9. $\sqrt{45} = 3\sqrt{5}$ ≈ 6.7

$\sqrt{9 \cdot 5}$

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

Simplify each expression below COMPLETELY! (Remember radicals follow the rules of exponents.)

10. $\sqrt{3} \cdot \sqrt{3}$

$\sqrt{3 \cdot 3}$

$\sqrt{9}$

± 3

11. $\sqrt{5} \cdot \sqrt{12} = 2\sqrt{15}$

$\sqrt{5 \cdot 12}$

$\sqrt{60}$

$\sqrt{4 \cdot 15}$

$\sqrt{4} \cdot \sqrt{15}$

12. $\frac{\sqrt{12}}{\sqrt{4}}$

$\sqrt{\frac{12}{4}}$

$\sqrt{3}$

13. $2\sqrt{2} \cdot \sqrt{12} = 4\sqrt{6}$

$2 \cdot \sqrt{2 \cdot 12}$

$2 \cdot \sqrt{24}$

$2 \cdot \sqrt{4 \cdot 6}$

$2\sqrt{4}\sqrt{6}$

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

14. $\sqrt{5} \cdot 2\sqrt{2}$

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

$2\sqrt{10}$

15. $\frac{\sqrt{20}}{\sqrt{5}}$

$\sqrt{\frac{20}{5}}$

$\sqrt{4}$

± 2

17. $\sqrt{\frac{81}{49}}$

$\frac{\sqrt{81}}{\sqrt{49}}$

$\pm\frac{9}{7}$

18. $\frac{10\sqrt{40}}{2\sqrt{10}}$ ± 10

$\frac{10}{2}\sqrt{\frac{40}{10}}$

$5\sqrt{4}$

$5 \cdot 2$

19. $4\sqrt{3} \cdot 2\sqrt{6}$ $= 24\sqrt{2}$

$4 \cdot 2 \cdot \sqrt{3 \cdot 6}$

$8\sqrt{18}$

$8\sqrt{9 \cdot 2}$

$8 \cdot \sqrt{9} \cdot \sqrt{2}$

$8 \cdot 3 \cdot \sqrt{2}$

Simplify each expression if possible. If it is not possible, explain why it can't be simplified.

20. $2\sqrt{10} + 5\sqrt{10}$ ← like $2x + 5x$

$7\sqrt{10}$

21. $3\sqrt{15} - 10\sqrt{15}$ ↙ like $3x - 10x$

$-7\sqrt{15}$

22. $9\sqrt{2} + 3\sqrt{6}$

Not possible b/c 2 & 6 are different bases

23. $4\sqrt{9} - 2\sqrt{25}$

$4 \cdot 3 - 2 \cdot 5$

$12 - 10$

2

*24. $3\sqrt{12} + \sqrt{3}$

$3\sqrt{4 \cdot 3}$
$3 \cdot \sqrt{4} \cdot \sqrt{3}$
$3 \cdot 2 \cdot \sqrt{3}$
} simplify $\sqrt{12}$

$6\sqrt{3} + 1\sqrt{3}$ now like $6x + 1x$

$7\sqrt{3}$