

Add, Subtract, & Multiply Radicals

Homework

Name: _____

Date: _____ Block: _____

Simplify.

1. $\sqrt[3]{32u^7v}$

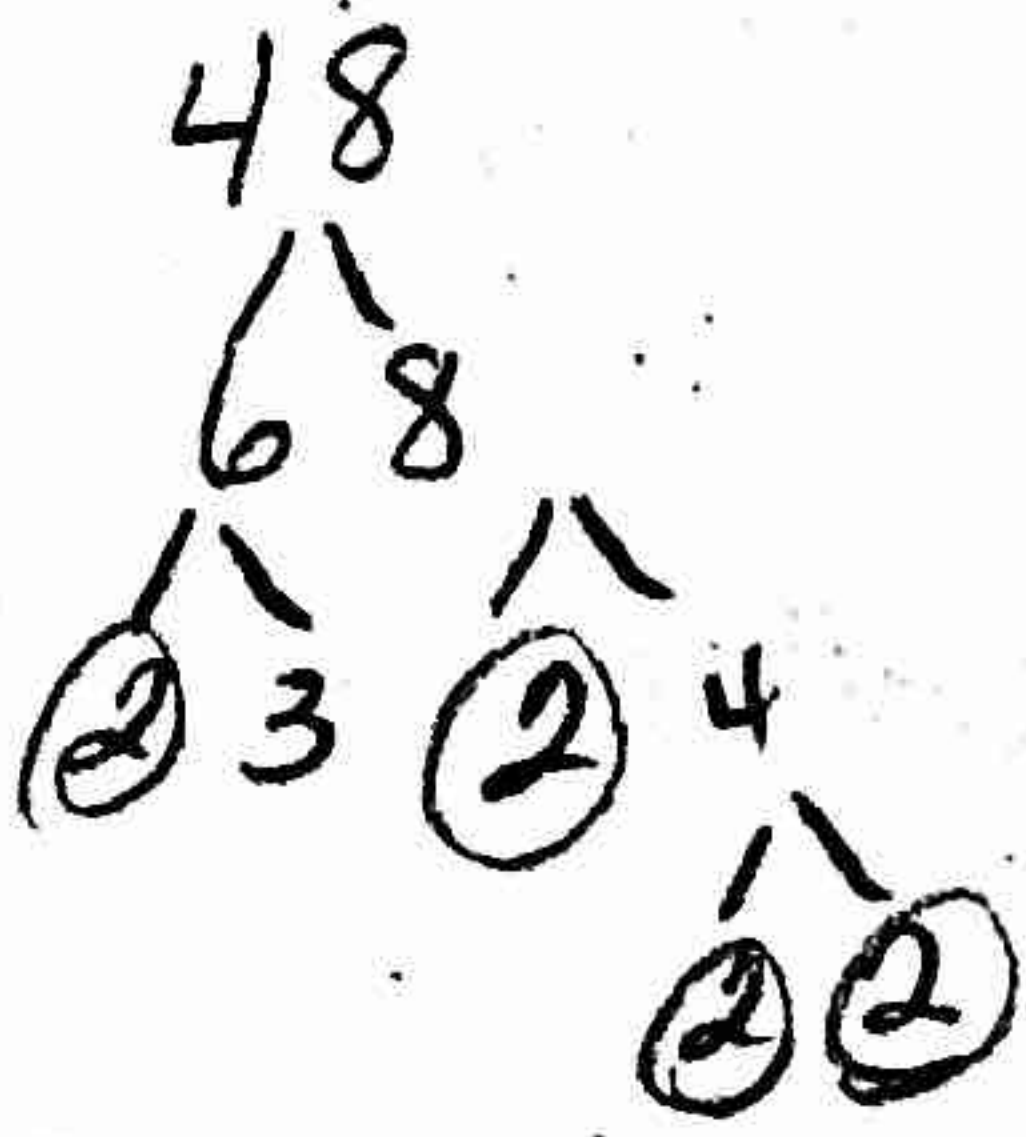
$$2u^2\sqrt[3]{4uv}$$



3. $8\sqrt[4]{48xy^7}$

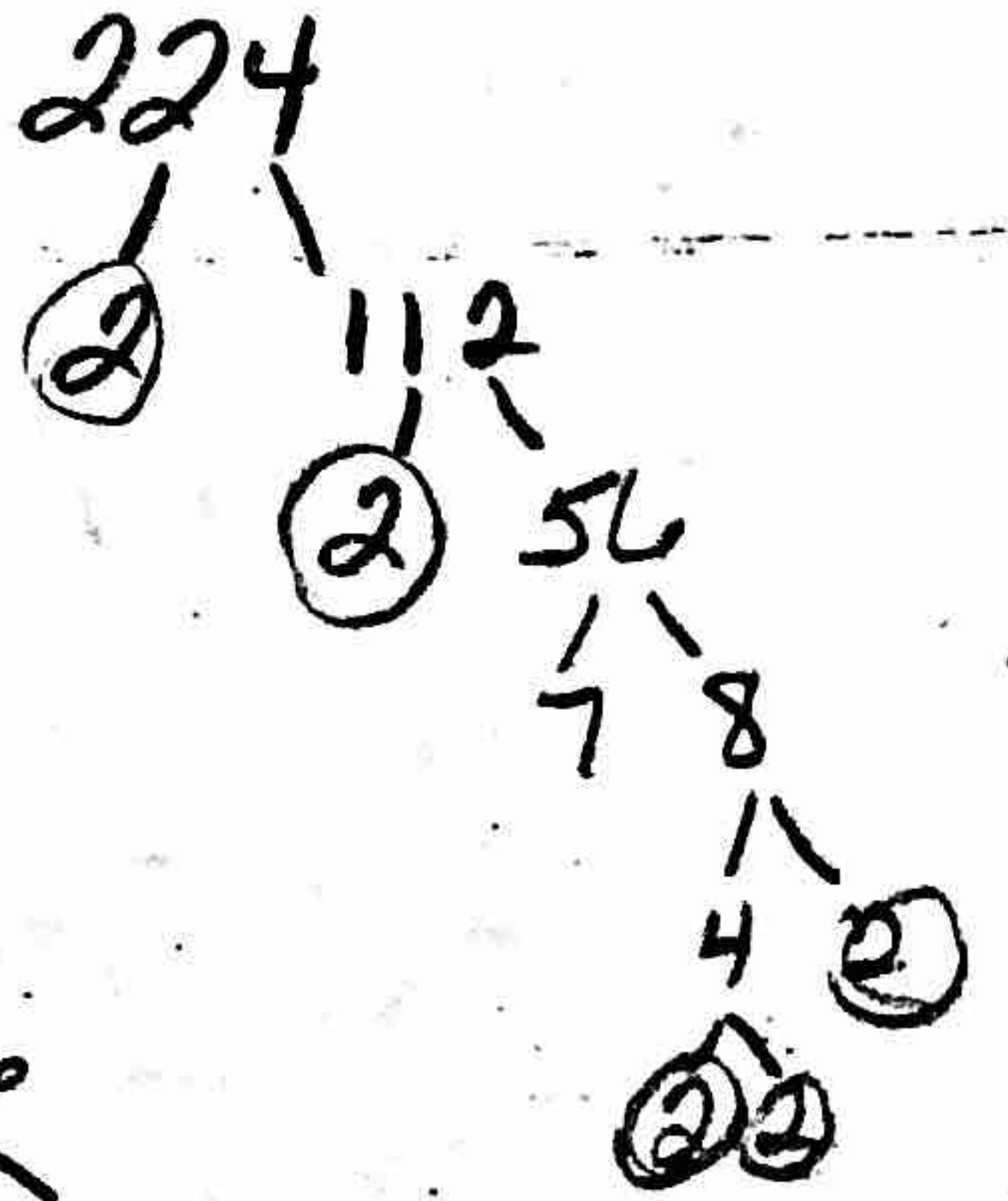
$$8 \cdot 2y\sqrt[4]{3xy^3}$$

$$16y\sqrt[4]{3xy^3}$$



2. $\sqrt[5]{224x^8y^3}$

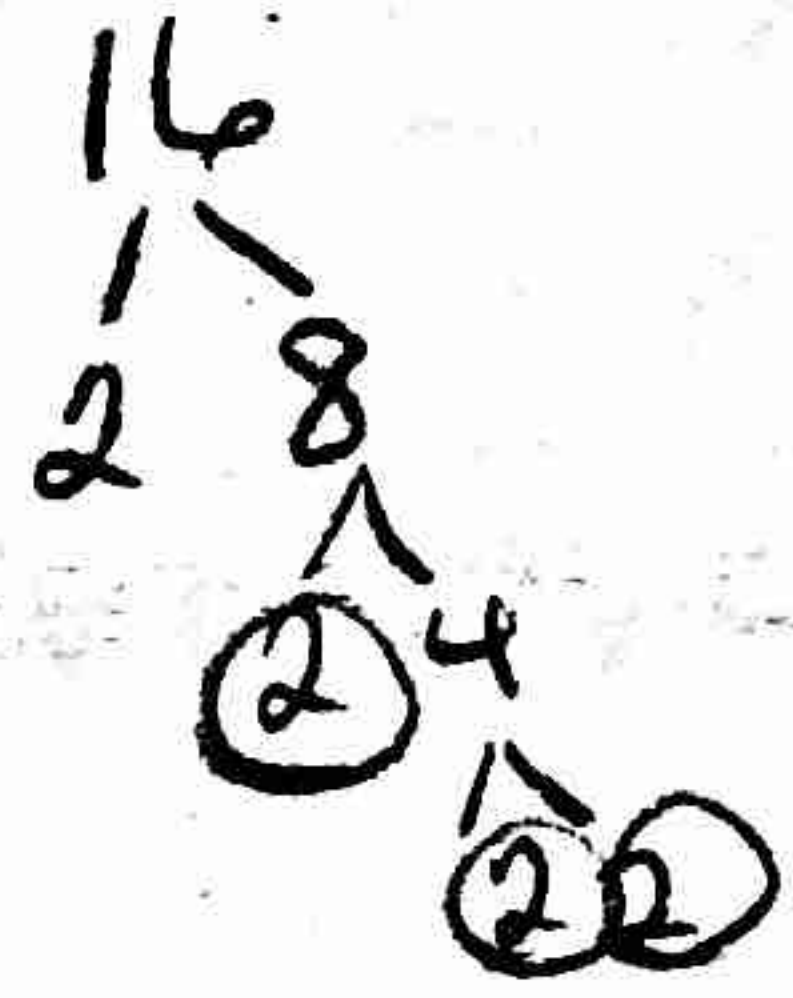
$$2x\sqrt[5]{7x^3y^3}$$



4. $-5\sqrt[3]{16a^4b^7}$

$$-5 \cdot 2ab^2\sqrt[3]{2ab}$$

$$-10ab^2\sqrt[3]{2ab}$$



5. $\sqrt{2} + \sqrt{8}$

$$\sqrt{2} + 2\sqrt{2}$$

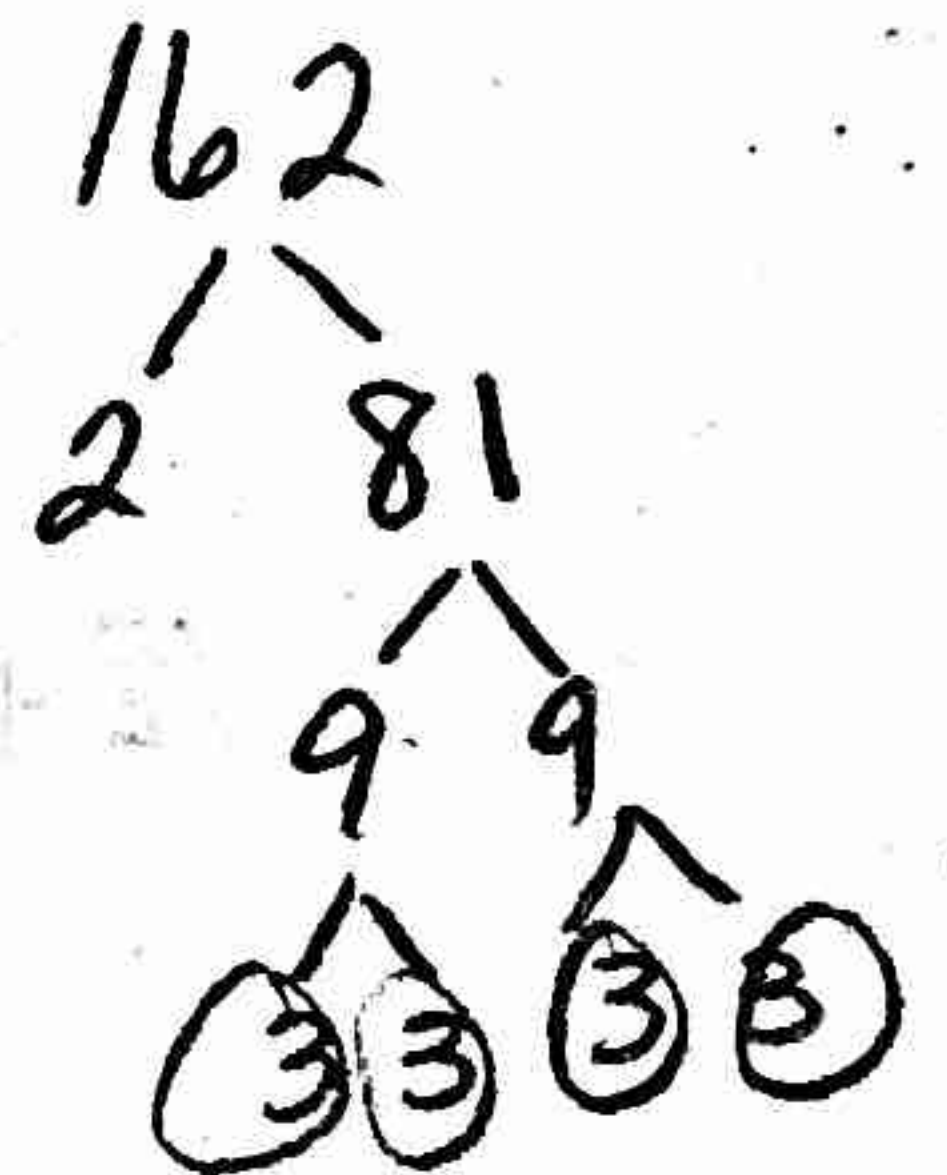
$$3\sqrt{2}$$

6. $7\sqrt[4]{32} + 3\sqrt[4]{162}$

$$7 \cdot 2\sqrt[4]{2} + 3 \cdot 3\sqrt[4]{2}$$

$$14\sqrt[4]{2} + 9\sqrt[4]{2}$$

$$23\sqrt[4]{2}$$



7. $8\sqrt{3} - 2\sqrt{2} + 3\sqrt{2} + 5\sqrt{3}$

$$13\sqrt{3} + \sqrt{2}$$

8. $\sqrt{18} + \sqrt{12} + \sqrt{8}$

$$3\sqrt{2} + 2\sqrt{3} + 2\sqrt{2}$$

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

9.2 4.2 + 4.2

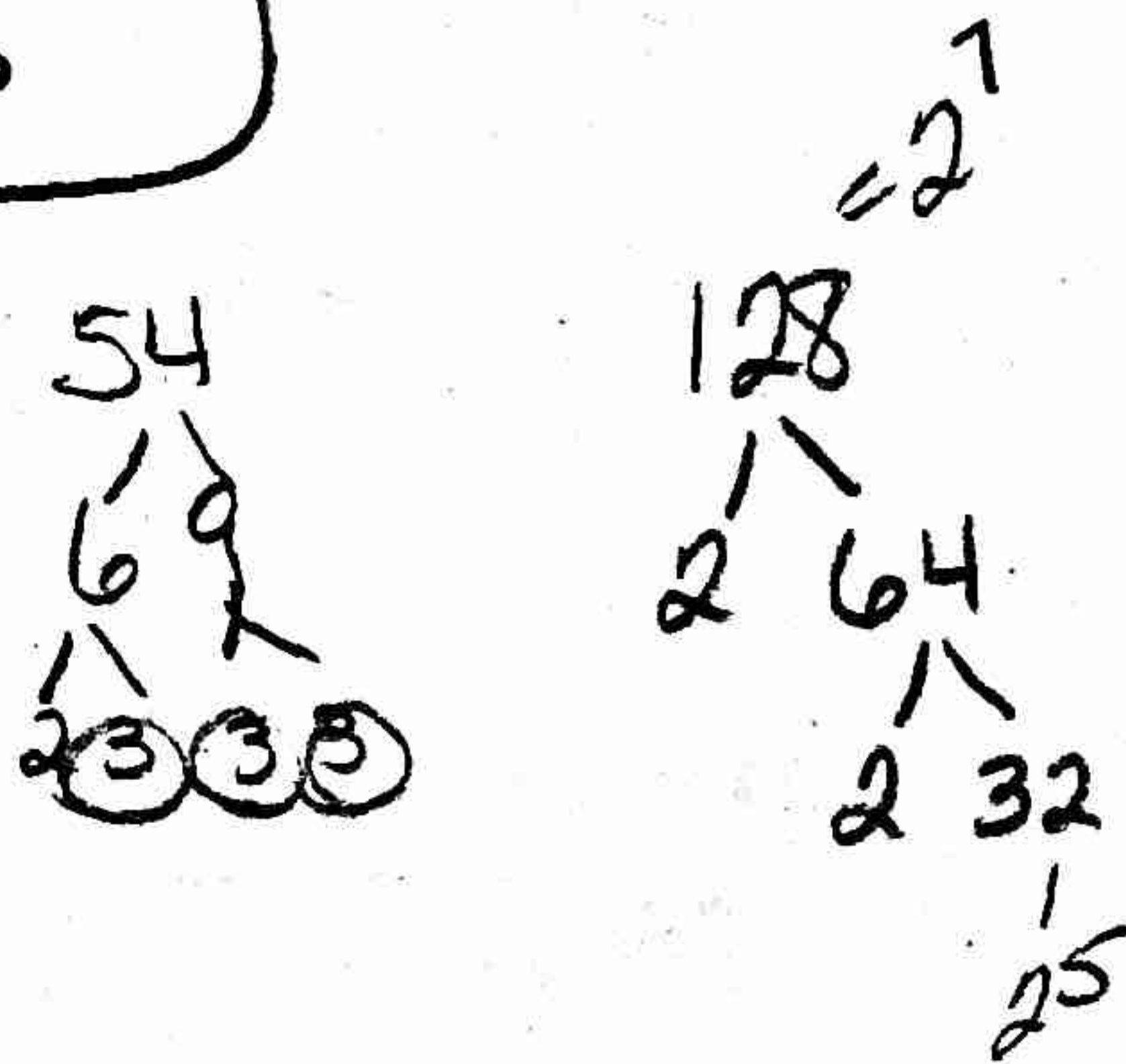
9. $3\sqrt{5} - \sqrt{x} + 4\sqrt{5} + 3\sqrt{x}$

$$7\sqrt{5} + 2\sqrt{x}$$

10. $\sqrt[3]{54} - \sqrt[3]{128}$

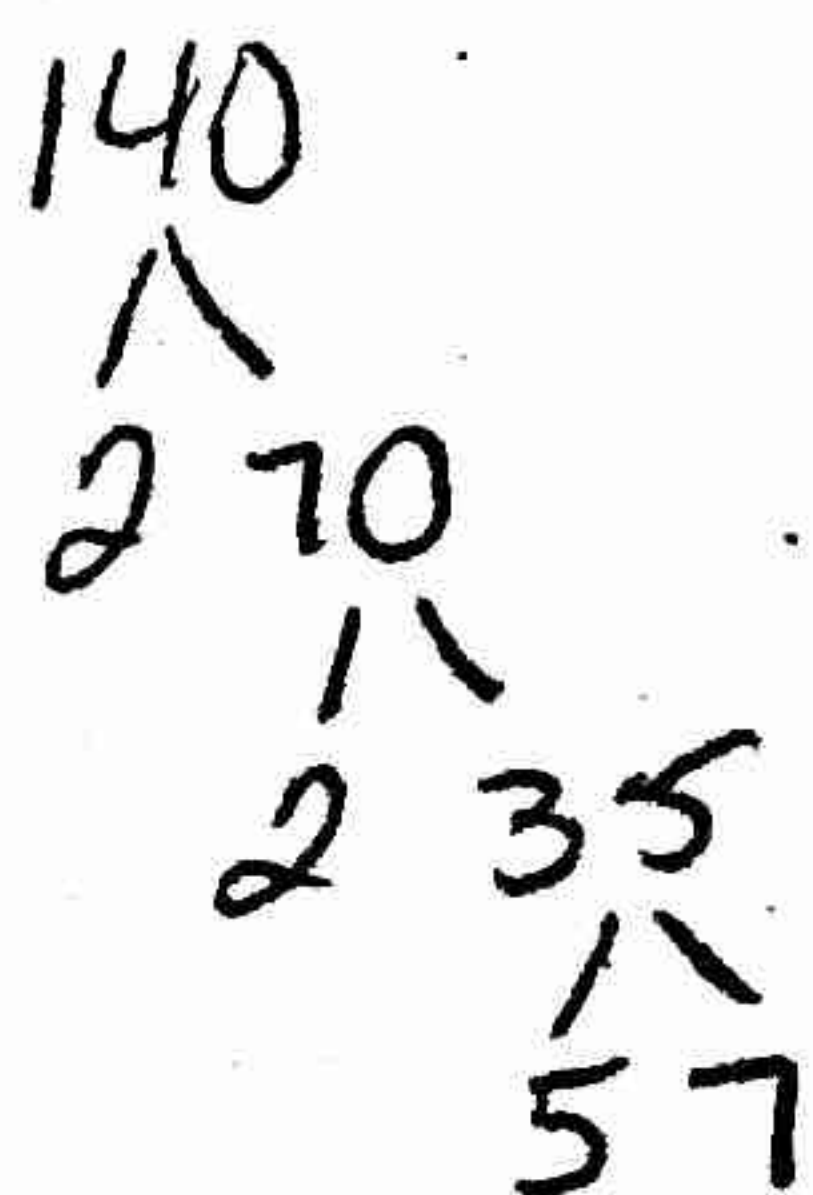
$$3\sqrt[3]{2} - 4\sqrt[3]{2}$$

$$-\sqrt[3]{2}$$



11. $\sqrt{10} \cdot \sqrt{14} = \sqrt{140}$

$$2\sqrt{35}$$



12. $\sqrt[3]{5a^2} \cdot \sqrt[3]{2a} = \sqrt[3]{10a^3}$

$$a\sqrt[3]{10}$$

$$13. \sqrt{6}(\sqrt{3} + 5\sqrt{2})$$

$$\begin{array}{r} \sqrt{18} + 5\sqrt{12} \\ 9 \cdot 2 \qquad 4 \cdot 3 \\ \hline 3\sqrt{2} + 10\sqrt{3} \end{array}$$

$$15. (7 - \sqrt{10})^2$$

$$\begin{array}{r} (7 - \sqrt{10})(7 - \sqrt{10}) \\ 49 - 7\sqrt{10} - 7\sqrt{10} + 10 \\ \hline 59 - 14\sqrt{10} \end{array}$$

$$17. (3 - \sqrt{5})(3 + \sqrt{5})$$

$$9 - 5$$

$$\boxed{4}$$

$$19. (3\sqrt{2} + 4\sqrt{3})^2$$

$$\begin{array}{r} (3\sqrt{2} + 4\sqrt{3})(3\sqrt{2} + 4\sqrt{3}) \\ 9\sqrt{4} + 12\sqrt{6} + 12\sqrt{6} + 16\sqrt{9} \\ 18 + 24\sqrt{6} + 48 = \boxed{66 + 24\sqrt{6}} \end{array}$$

$$21. (2\sqrt{10} + 3\sqrt{15})(3\sqrt{3} - 2\sqrt{2})$$

$$\begin{array}{r} \cancel{6\sqrt{30}} - 4\sqrt{20} + 9\sqrt{45} - \cancel{6\sqrt{30}} \\ 4 \cdot 5 \qquad 9 \cdot 5 \end{array}$$

$$-8\sqrt{5} + 27\sqrt{5}$$

$$\boxed{19\sqrt{5}}$$

Challenge!

$$23. \sqrt[3]{(x+5)^2} \cdot \sqrt[3]{(x+5)^4}$$

$$\sqrt[3]{(x+5)^6} = \boxed{(x+5)^2}$$

$$14. (\sqrt{5} - \sqrt{2})(\sqrt{14} + \sqrt{35})$$

$$\begin{array}{r} \sqrt{70} + \sqrt{175} - \sqrt{28} - \sqrt{70} \\ 25 \cdot 7 \qquad 4 \cdot 7 \\ 5\sqrt{7} - 2\sqrt{7} \\ \hline 3\sqrt{7} \end{array}$$

$$16. \sqrt[3]{2}(\sqrt[3]{4} - \sqrt[3]{12})$$

$$\begin{array}{r} \sqrt[3]{8} - \sqrt[3]{24} \\ 2 - 2\sqrt[3]{3} \end{array}$$

$$18. (3\sqrt{2} + \sqrt{7})(\sqrt{2} - 2\sqrt{7})$$

$$3\sqrt{4} - 6\sqrt{14} + \sqrt{14} - 2\sqrt{49}$$

$$6 - 5\sqrt{14} - 14$$

$$\boxed{-8 - 5\sqrt{14}}$$

$$20. (\sqrt{6} + \sqrt{8})(\sqrt{24} + \sqrt{2})$$

$$\begin{array}{r} \sqrt{144} + \sqrt{12} + \sqrt{192} + \sqrt{16} \\ 12 + 2\sqrt{3} + 8\sqrt{3} + 4 \end{array}$$

$$\boxed{16 + 10\sqrt{3}}$$

$$22. (5\sqrt{2} + 3\sqrt{5})(2\sqrt{10} - 3)$$

$$\begin{array}{r} 10\sqrt{20} - 15\sqrt{2} + 6\sqrt{50} - 9\sqrt{5} \\ 4 \cdot 5 \qquad 25 \cdot 2 \end{array}$$

$$20\sqrt{5} - 15\sqrt{2} + 30\sqrt{2} - 9\sqrt{5}$$

$$\boxed{11\sqrt{5} + 15\sqrt{2}}$$