Name: _____

Unit 5B – Radicals

WS-1: Radical Operations

Simply each expression. Give exact answers

1. $\sqrt{12}+\sqrt{24}$
2. $\frac{\sqrt{2}}{2}+\sqrt{2}$
3. $\sqrt[3]{24}+\sqrt[3]{81}$
4. $\sqrt[4]{48}-\sqrt[4]{243}$
5. $\sqrt[3]{2000w^2z^3}-\sqrt[3]{16w^2z^5}$

Simplify the product. Give exact answers

6. $\sqrt{3}\bullet\sqrt{5}$
7. $2\sqrt{5}\bullet 3\sqrt{10}$
8. $3\sqrt{2}\bullet -4\sqrt{10}$
9. $\sqrt[3]{\frac{4x^2}{3}}\bullet\sqrt[3]{\frac{2x^2}{3}}$
10. $\sqrt[4]{\frac{4x^2}{5}}\bullet\sqrt[4]{\frac{4x^3}{25}}$
11. $\left(2\sqrt{5}-7\right)\left(2\sqrt{5}+4\right)$
12. $\left(3\sqrt{3}-\sqrt{2}\right)\left(\sqrt{2}+\sqrt{3}\right)$

Write each product as a single radical expression.

13. $\sqrt[3]{3}\bullet\sqrt{3}$
14. $\sqrt[3]{5}\bullet\sqrt[4]{5}$
15. $\sqrt[3]{2}\bullet\sqrt{5}$
16. $\sqrt[3]{2}\bullet\sqrt[4]{3}$

Find the product of each pair of conjugates.

17. $\left(\sqrt{5}+\sqrt{2}\right)\left(\sqrt{5}-\sqrt{2}\right)$
18. $\left(3\sqrt{2}+\sqrt{5}\right)\left(3\sqrt{2}-\sqrt{5}\right)$
19. $\left(4\sqrt{y}+3\sqrt{z}\right)\left(4\sqrt{y}-3\sqrt{z}\right)$

Simplify each expression.

20. $\frac{1}{\sqrt{2}}-\frac{1}{\sqrt{8}}+\frac{1}{\sqrt{18}}$
21. $\frac{1}{\sqrt{3}}+\sqrt{\frac{1}{3}}-\sqrt{3}$
22. $\left(3+\sqrt{x}\right)^2$
23. $\left(\sqrt{x-1}+1\right)^2$
24. $\sqrt[3]{\frac{y^7}{4x}}$
25. $\sqrt[4]{\frac{16}{9z^3}}$
26. $\sqrt[3]{\frac{x}{5}}\bullet\sqrt[3]{\frac{x^5}{5}}$

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