

Name: _____ Date: _____ Block: _____

Chapter 6 EXTRA-CREDIT PACKET**Simplify each radical expression. Use absolute value symbols when needed.**

1. $\sqrt{49x^2y^{10}}$

2. $\sqrt[3]{-64y^9}$

3. $\sqrt[5]{243x^{15}}$

Simplify. Assume that all variables are positive.

4. $\sqrt{600x^6y^3}$

5. $\sqrt[3]{54xy^5}$

6. $\sqrt[4]{64x^4y^8}$

Multiply or divide and simplify. Assume that all variables are positive.

7. $\sqrt{7x^3} \cdot \sqrt{14x}$

8. $3\sqrt[4]{4x^3} \cdot \sqrt[4]{8xy^5}$

9. $\frac{\sqrt{32a^7b^2}}{\sqrt{2a^3b}}$

Simplify. Rationalize all denominators. Assume that all variables are positive.

10. $\sqrt{2x} - \sqrt{8x} + \sqrt{18x}$

11. $(5 + \sqrt{3})(2 - \sqrt{3})$

12. $\frac{6}{7 + 2\sqrt{3}}$

Write each expression in exponential form.

13. $\sqrt[3]{4x^2}$

14. $\sqrt{5ab}$

15. $\sqrt{65x^4y}$

Write each expression in radical form.

16. $3x^{\frac{1}{3}}$

17. $2^{\frac{3}{4}}$

18. $x^{-2.25}$

Write each expression in simplest form. Assume that all variables are positive.

19. $4\sqrt[3]{81} - 3\sqrt[3]{54}$

20. $\left(\frac{3}{x^4}\right)^{\frac{4}{3}}$

21. $\left(x^{\frac{3}{8}}y^{\frac{1}{4}}\right)^{16}$

Do you UNDERSTAND?

22. **Writing** Explain when absolute value symbols are needed when you are simplifying radical expressions.

23. **Error Analysis** Explain the error in this simplification of radical expressions. What is the correct simplification? $\sqrt{2} \cdot \sqrt[3]{8} = \sqrt{2(8)} = \sqrt{16} = 4$

24. An object is moving at a speed of $(5 - \sqrt{3})$ mi/h. How long will it take the object to travel 35 mi?

25. **Reasoning** Show that $\sqrt[6]{x^3} = \sqrt{x}$ by rewriting $\sqrt[6]{x^3}$ in exponential form.

Solve each equation. Check for extraneous solutions.

26. $\sqrt{5x-1} + 3 = x$

27. $(x^2 + 13)^{\frac{1}{2}} = 7$

28. $\sqrt{2-x} - x = 4$

Let $f(x) = 2x + 3$ and $g(x) = x^2 - x$. Find each value.

29. $(f + g)\left(\frac{1}{2}\right)$

30. $\left(\frac{f}{g}\right)(2)$

31. $(g \cdot f)(5)$

For each pair of functions, find $(g \circ f)(x)$ and $(f \circ g)(x)$.

32. $f(x) = 2x - 1$ and $g(x) = 3x^2 + 12$

33. $f(x) = 3x + 1$ and $g(x) = x^2 + 2$

Find the inverse of each function. Is the inverse a function?

34. $f(x) = x^2 - 3$

35. $f(x) = \sqrt{\frac{x-5}{4}}$

36. $f(x) = (x-2)^3 + 1$

Graph. Find the domain and range of each function.

37. $y = -\sqrt[3]{8x} + 5$

38. $y = 6 - \sqrt{3x + 1}$

39. $y = \frac{2}{3}\sqrt{x}$

Do you UNDERSTAND?

40. Multiple Choice The graph of $y = -\sqrt{x}$ is shifted 4 units up and 3 units right. Which equation represents the new graph?

A $y = -\sqrt{x-4} + 3$

C $y = -\sqrt{x-3} + 4$

B $y = -\sqrt{x-3} + 4$

D $y = -\sqrt{x+4} + 3$

41. Writing Explain the relationship between the domain of a function and the range of the function's inverse.

42. A store is having a sale with a 15% discount on all items. In addition, employees get a \$20 discount on purchases of \$100 or greater. Will an employee get a better deal if the \$20 discount is applied first or if the 15% discount is applied first to their purchase of \$100?

43. A spherical water tank holds 6000 ft^3 of water. What is the diameter of the tank? (*Hint:*

$$V = \frac{\pi}{6}d^3)$$