Algebra II: Chapter 6 Review
Date:

Name: Key
Period:

1. Find the indicated real nth root(s) of a. given n = 3, a = -64.

$\sqrt[3]{-64} = -4$

2. Evaluate the expression, $\sqrt[5]{243}$, without a calculator. $= 3$

3. Evaluate the expression, $(-27)^{2/3}$, without a calculator. $= 9$

4. Evaluate the expression, $\sqrt[3]{1228}$, using a calculator. Round the result to two decimal places if appropriate. $= 10.71$

Simplify the expression. Assume all variables are positive.

5. $\dfrac{125^{-2/3}}{125^{-5/3}} = 125$

$125^{-\frac{2}{3}} \cdot 125^{\frac{5}{3}} = 125^{\frac{3}{3}} = 125$

6. $3\sqrt{28} - \sqrt{63} = 6\sqrt{7} - 3\sqrt{7}$

$= 3\sqrt{7}$

7. $5a^5b^3$

10. $\sqrt[3]{\dfrac{c}{a^3}} \cdot \dfrac{\sqrt[3]{a^2}}{\sqrt[3]{b^2}} = \dfrac{\sqrt[3]{ca^2}}{a^2}$

7. $\sqrt[3]{64x^4y^2} = 4x\sqrt[3]{xy^2}$

8. $\dfrac{6y^{3.5}}{y^{1.26}} = 6y^{2.24}$

Let $f(x) = x^2 - 5$ and $g(x) = -x^3$. Perform the indicated operation and state the domain.

9. $f(x) - g(x) = x^2 - 5 - x^3$

$= x^3 + x^2 - 5$

domain: $\mathbb{R}$

10. $f(x) \cdot g(x) = (x^2 - 5) - x^3$

$= -x^5 + 5x^3$

domain: $\mathbb{R}$

11. $\dfrac{f(x)}{g(x)} = \dfrac{x^2 - 5}{-x^3} = \dfrac{1}{x} + \dfrac{5}{x^3}$

domain: $x \neq 0$

12. $g(f(x)) = -(x^2 - 5)^3$

$= -(x^6 - 15x^4 + 75x^2 - 125)$

$= -x^6 + 15x^4 - 75x^2 + 125$

domain: $\mathbb{R}$

Verify that f and g are inverse functions.

13. $f(x) = 2x - 5,\ g(x) = \dfrac{x+5}{2}$

$f(g(x)) = 2\left(\frac{x+5}{2}\right) - 5 = x + 5 - 5 = x$

$g(f(x)) = \frac{2x-5+5}{2} = \frac{2x}{2} = x$

14. $f(x) = 3x^7,\ g(x) = \sqrt[7]{\dfrac{x}{3}}$

$f(g(x)) = 3\left(\sqrt[7]{\frac{x}{3}}\right)^7 = 3\left(\frac{x}{3}\right) = x$

$g(f(x)) = \sqrt[7]{\frac{3x^7}{3}} = \sqrt[7]{x^7} = x$

Find the inverse function.

15. $f(x) = 4x^6,\ x \geq 0$

$x = 4y^6$

$\frac{x}{4} = y^6$

$y = \sqrt[6]{\frac{x}{4}}$

16. $f(x) = \frac{1}{3}x^5 + 6$

$x = \frac{1}{3}y^5 + 6$

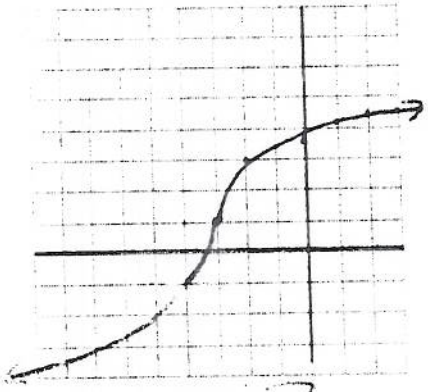
$\frac{1}{3}y^5 = x - 6$

$y^5 = 3x - 18$

$y = \sqrt[5]{3x-18}$

Graph the function. Compare with the parent graph. Then state the domain and range.

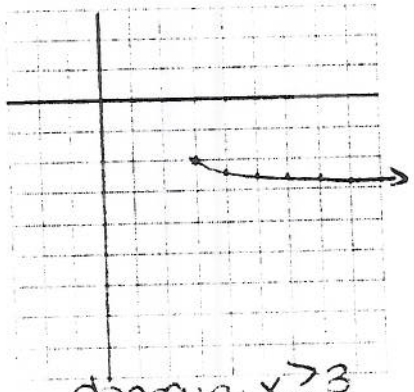
17. $y = 2\sqrt[3]{x+3} + 1$ WIDER ←3 ↑1



domain: $\mathbb{R}$

range: $\mathbb{R}$

18. $y = -\frac{1}{3}\sqrt{x-3} - 2$ FLIPPED FLATTER →3 ↓2



domain: $x \geq 3$

range: $y \leq -2$

Solve the equation.

19. $\sqrt[3]{5x-4} = 2$

$5x - 4 = 8$

$5x = 12$

$x = \frac{12}{5}$

20. $50 - \frac{1}{5}(x+5)^{3/2} = 25$

$-\frac{1}{5}(x+5)^{3/2} = -25$

$(x+5)^{3/2} = 125$

$x + 5 = 25$

$x = 20$

21. $x + 1 = \sqrt{13 + x}$

$x^2 + 2x + 1 = 13 + x$

$x^2 + x - 12 = 0$

$(x+4)(x-3) = 0$

$x = -4, 3$

22. $\sqrt{x+6} = \sqrt{11 - x} - 3$

$x + 6 = 11 - x - 6\sqrt{11-x} + 9$

$2x - 14 = -6\sqrt{11-x}$

$x - 7 = -3\sqrt{11-x}$

$x^2 - 14x + 49 = 9(11 - x)$

$x^2 - 14x + 49 = 99 - 9x$

$x^2 - 5x - 50 = 0$

$(x-10)(x+5) = 0$

$x = 10, -5$