Chapter 7 Review – Show ALL work for credit! **Name**_____**#**_____

When simplifying expressions it may be helpful to ask yourself the following questions:

- ☑ Should I rewrite the problem?
- ☑ Is it possible to write any numbers using "special powers?"
- ☑ Are the any exponent rules I can apply?
- ☑ Do I have like bases or indices?
- ☑ Are there any fractional exponents in the denominator?
- ☑ Is my answer in the simplest form?

Simplify the expression.

1. $\left(\frac{81x^2}{y^4}\right)^{3/4}$
2. $\frac{1}{5x^{1/3}}$
3. $\left(x^2y\right)^{-1/3}$
4. $\frac{\sqrt[4]{125}}{\sqrt[4]{5}}$
5. $\frac{x^3}{y^{1/2}} \bullet \frac{y}{x^{1/3}}$
6. $7^{5/2} \bullet 7^{1/2}$
7. $x^{1/3} \bullet x^{3/4}$
8. $\frac{y^{5/6}}{y^{1/6}}$
9. $\left(64\right)^{2/3}$
10. $\left(\frac{16}{81}\right)^{1/4}$
11. $\left(\frac{1}{32}\right)^{-3/5}$
12. $\sqrt{2} \bullet \sqrt[3]{2^4}$
13. $\sqrt{13} \bullet \sqrt[3]{13^2}$
14. $\sqrt[4]{49}$
15. $27^{1/6}$
16. $8^{-2/3} \bullet 64^{1/6}$
17. $\sqrt{98y^4}$
18. $3\sqrt[3]{56a^7b^4}$
19. $\sqrt[6]{256s^{11}p^{18}}$
20. $\sqrt[5]{96x^6y^{10}z^5}$

When finding the inverse of a relation or function remember to:

- ☑ Switch the x and y.
- ☑ Solve for y.

Find the inverse of the given function.

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

22. $f(x) = 4x - 4$

23. $f(x) = (x-4)^2$

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

Find $f(g(x))$ and $g(f(x))$ for each pair of functions.

25. $f(x) = x^2 + 2x;\ g(x) = x - 9$

26. $f(x) = x^2 - 1;\ g(x) = -4x^2$

When determining if the given functions are inverses of each other:

- ☑ Find f(g(x)). It should simplify to be x.
- ☑ Find g(f(x)). It should simplify to be x.
- ☑ If both the above happens, then the functions are inverses of each other.

Determine if the given functions are inverses of each other.

27. $f(x) = \frac{x-2}{3};\ g(x) = 3x - 2$

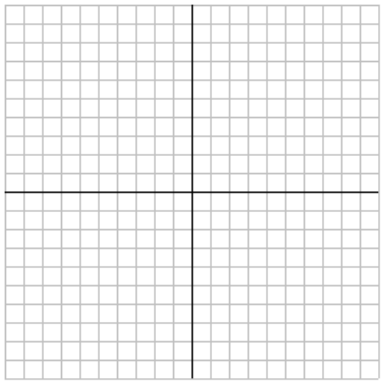
28. $f(x) = \frac{x-1}{2};\ g(x) = 2x + 1$

When graphing a radical function:

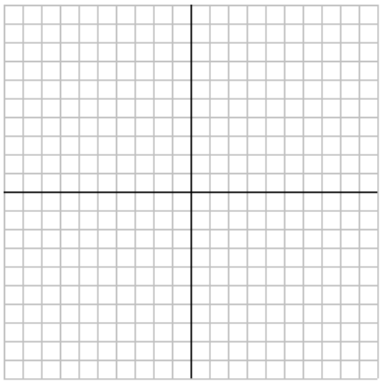
- ☑ Identify the three important points for each graph.(x-values that give $\sqrt{0}, \sqrt{1}, \sqrt{4},$ *or* $\sqrt[3]{-1}, \sqrt[3]{0}, \sqrt[3]{1},$)
- ☑ Sketch the curve.
- ☑ Analyze the graph to see if it matches the shift: (h, k) and the "a" effect on the parent graph.

Graph the radical function.

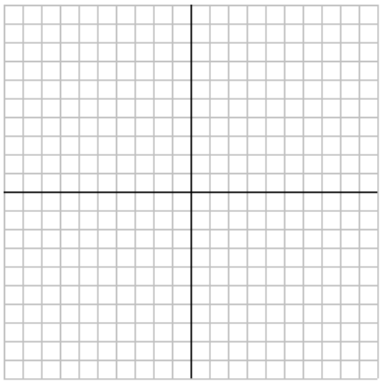
29. $f(x) = -5\sqrt{x}$



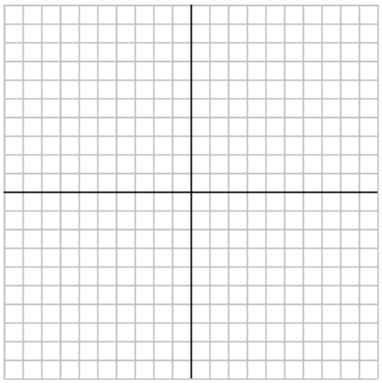
30. $f(x) = (x-1)^{1/2} + 7$



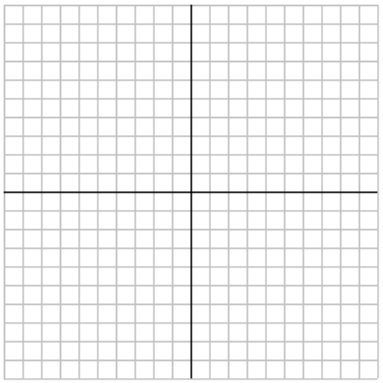
31. $f(x) = \sqrt[3]{x} - 7$



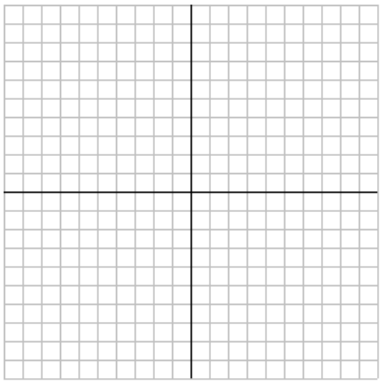
32. $f(x) = \sqrt{x+6}$



33. $f(x) = -2\sqrt[3]{x+4} - 1$



34. $f(x) = -4\sqrt[3]{x-1} + 2$



When solving a radical equation remember to do the following:

- ☑ Isolate the radical/rational expression.
- ☑ Apply the appropriate exponent to each side.
- ☑ Solve for the variable.
- ☑ Check your solutions.

Solve the radical equation and check your answers for extraneous solutions.

35. $9 + \sqrt{x+6} = 11$

36. $\sqrt[3]{2p+1} = 3$

37. $-\frac{1}{2}x^{1/5} = 10$

38. $\frac{2}{5}\sqrt{10x+6} = 12$

39. $(x-7)^{2/3} = 36$

40. $\sqrt[3]{6x+192} - \sqrt[3]{2x} = 0$

41. $\sqrt{x-2} = x-2$

42. $x^{5/2} - 10 = 22$

43. $3(x+1)^{4/5} - 37 = 11$

44. $(x+8)^{1/4} + 1 = 0$

Answers

1. $\frac{27x^{3/2}}{y^3}$
2. $\frac{x^{2/3}}{5x}$
3. $\frac{\sqrt[3]{xy^2}}{xy}$
4. $\sqrt{5}$
5. $x^{8/3}y^{1/2}$
6. 343
7. $x^{13/12}$
8. $y^{2/3}$
9. $\frac{1}{16}$
10. $\frac{2}{3}$
11. 8
12. $2\sqrt[6]{32}$
13. $13\sqrt[6]{13}$
14. $\sqrt{7}$
15. $\sqrt{3}$
16. $\frac{1}{2}$
17. $7y^2\sqrt{2}$
18. $6a^2b^3\sqrt{7ab}$
19. $2p^3s\sqrt[6]{4s^5}$
20. $2xy^2z\sqrt[5]{3x}$
21. $y=\sqrt{x+3}$
22. $y=\frac{x+4}{4}$
23. $y=\sqrt{x}+4$
24. $y=\sqrt{x+3}-2$
25. $f(g(x))=x^2-16x+63$
    $g(f(x))=x^2+2x-9$
26. $f(g(x))=16x^4-1$
    $g(f(x))=-4x^4+8x^2-4$
27. No
28. Yes
35. -2
36. 13
37. -3,200,000
38. 89.4
39. 223, -209
40. -48
41. 2, 3
42. 4
43. 31, -33
44. No solution