Rewrite using the properties of exponents.

1) $n^{2/9} \cdot n^{5/9} \cdot n^{1/9}$

2) $a^{5/4} \cdot a^{3/10} \cdot a^{2/5}$

3) $\left(\dfrac{8w^{12}}{343} \right)^{1/3}$

Switch forms. (radical <—> exponential)   *Simplify.*

4) $\sqrt{x^3}$

5) $18^{\frac{2}{3}}$

6) $\sqrt{128x^{14}y^9}$

7) $\sqrt[4]{16a^{20}b^{14}}$

What rational exponent must equal "y" for each
equation to be true.

Simplify. Is the answer rational or irrational?

8) $\sqrt[3]{\sqrt{x^7}} = x^y$

9) $\sqrt{\sqrt[3]{(x-1)^{24}}} = (x-1)^y$

10) $-4\sqrt{10} - 13\sqrt{10}$

11) $-3\sqrt{2} * 4\sqrt{32}$

Solve the equation. Check for extraneous solutions.

12) $\sqrt[4]{3x^2 - 48} = \sqrt[4]{2x^2 + 2x}$
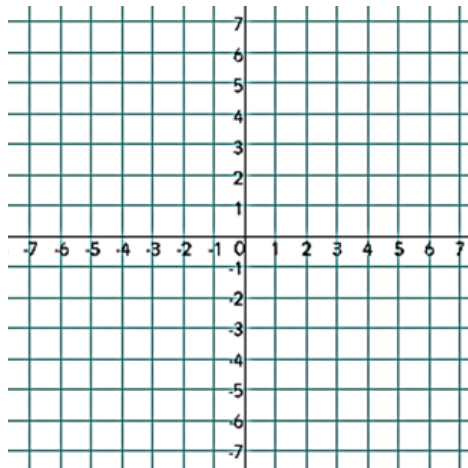
13) $(x+1)^{\frac{3}{2}} - 2 = 25$

Solve the equation. Check for extraneous solutions.
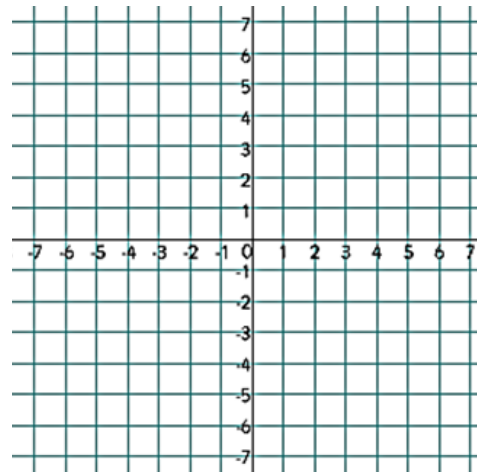
14) $2 \cdot \sqrt[3]{4x+16} + 21 = 29$

15) $x - 8 = \sqrt{-25x} - 2$

Graph the function and state the domain and range.

16) $a(x) = -\sqrt{x+2} + 5$

17) $b(x) = \dfrac{1}{2}\sqrt{x-2} - 3$

Describe the transformation from f(x) to g(x).
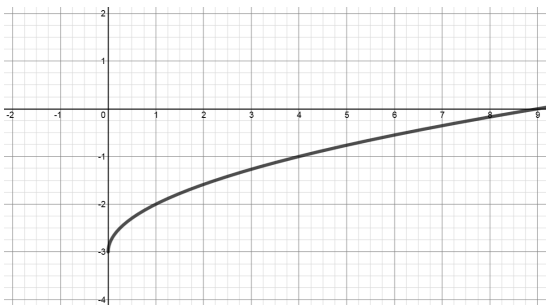
18) $f(x) = \sqrt{x+2} - 3$
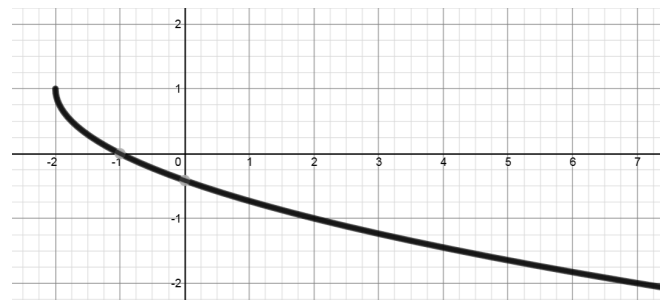
$g(x) = \sqrt{x} + 1$

19) $f(x) = \sqrt{x-2}$

$g(x) = \dfrac{1}{3}\sqrt{x+8} - 5$

Determine the function that matches each graph. State the domain and range too.

20)

21)

22) The population of a small town can be modeled by the function $P(x) = 15,750\sqrt[3]{x - 1999}$, where 'x' is the year and 2000 is the first year that applies to this model. Answer these questions based upon the model:

A) Rewrite the model $P(x) = 15,750\sqrt[3]{x - 1999}$ in rational exponent form.

B) State the domain and range, in interval notation, of the model.

C) Based on the model, what will be the population of the small town in 2030?

D) In what year would the population of the small town reach 50,000?