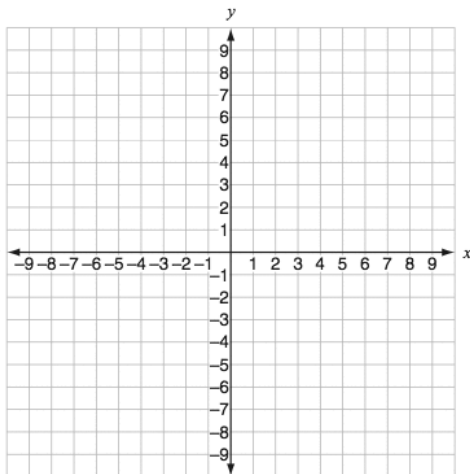
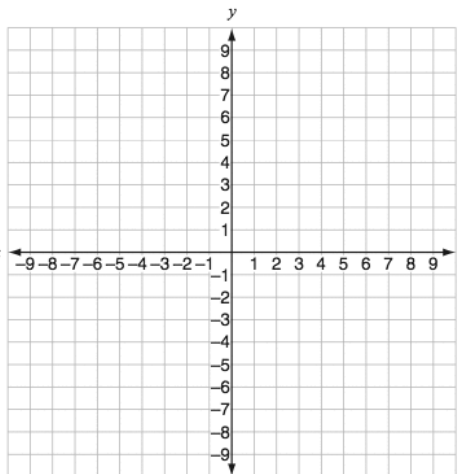
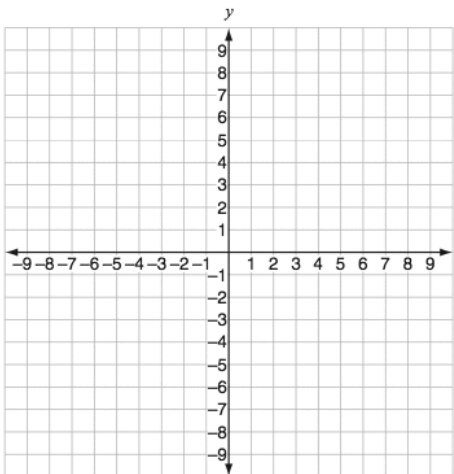


Sketch the graph of each function. List the domain and range. List the transformations from the parent function.

1)  $y = 3\sqrt[3]{x} - 1$

2)  $y = 2\sqrt{x-1} - 2$

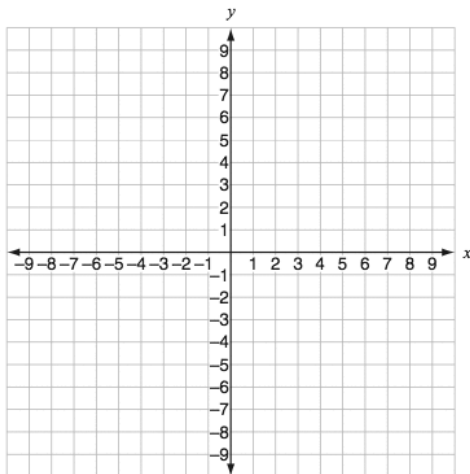
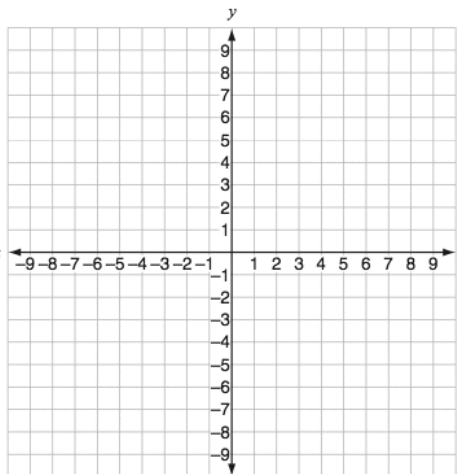
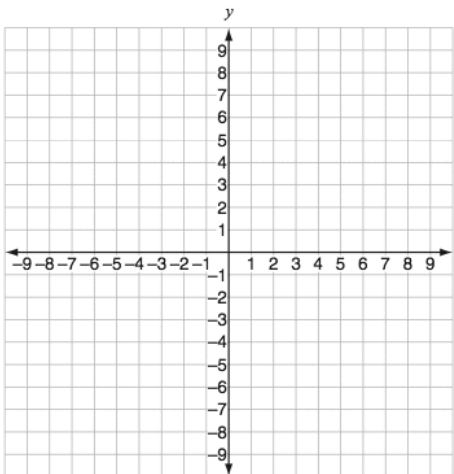
3)  $y = \sqrt[3]{-\frac{1}{3}x + 1}$



4)  $y = -\sqrt{3x} - 4$

5)  $y \geq -\frac{1}{3}\sqrt{x+1}$

6)  $y < \sqrt[3]{-x+4}$



Solve each equation or inequality. Remember to check for extraneous solutions.

$$7) 3\sqrt[3]{x+4} = \sqrt[3]{-1-4x}$$

$$8) x = (-56 + 15x)^{\frac{1}{2}}$$

$$9) r = -1 + \sqrt{7r+15}$$

$$10) 8 = (m-7)^{\frac{1}{2}} + 7$$

$$11) -2\sqrt{x+3} \geq 6$$

$$12) \sqrt{3x+6} \leq 3$$

$$13) \frac{1}{4}\sqrt{2x-8} + 5 > 13$$

$$14) \sqrt[3]{3x} - 6 \leq 9$$

$$15) 3(5x+1)^{\frac{1}{4}} = 6$$

$$16) \sqrt{-14x+2} = x-3$$

$$17) v = \sqrt{-1-2v}$$

$$18) v = \sqrt{5v}$$

$$19) -3\sqrt{2x-1} = 4\sqrt{x-4}$$

Write the radical function given the following transformations.

20) The parent function  $f(x) = \sqrt{x}$  vertically compressed by  $1/3$ , translated left 4, and up 2.

21) The parent function  $f(x) = \sqrt[3]{x}$  reflected across the x-axis, horizontally stretched by 4, and shifted down 1.

22) The parent function  $f(x) = \sqrt{x}$  reflected over the y-axis, horizontally compressed by  $1/2$ , and shifted right 3.

Solve for the specified variable.

23)  $A = \frac{1}{2}h(b_1 + b_2)$ , for  $b_2$

24)  $SA = \frac{1}{3}\pi r^2 h$ , for  $h$ .

25)

. A biologist is studying two species of animals in a habitat. The population,  $p_1$ , of one of the species is growing according to  $p_1 = 500t^{\frac{3}{2}}$  and the population,  $p_2$ , of the other species is growing according to  $p_2 = 100t^2$  where time,  $t$ , is measured in years. After how many years will the populations of the two species be equal?

- 26) **The formula  $s = \sqrt{30fd}$  can be used to estimate the speed,  $s$ , in miles per hour that a car is traveling when it goes into a skid, where  $f$  is the coefficient of friction and  $d$  is the length of the skid marks in feet.**
1. How does the speed vary as the length of the skid marks? \_\_\_\_\_
  2. Kody skids to a stop on a street with a speed limit of 35 mi/h. His skid marks measure 52 ft, and the coefficient of friction is 0.7. Kody says that he was driving only about 30 mi/h. Kody wants to prove that he was not speeding.
    - a. Solve the equation for  $d$  in terms of  $s$ . \_\_\_\_\_
    - b. How long would the skid marks be if he had been driving at a speed of 35 mi/h? \_\_\_\_\_
    - c. Was Kody speeding or not? Explain how you know.  
\_\_\_\_\_
    - d. Find his actual speed. \_\_\_\_\_

- 27) The radius  $r$  in feet of a spherical water tank can be determined by using the formula  $r = \sqrt[3]{\frac{3V}{4\pi}}$ , where  $V$  is the volume of the tank in cubic feet. To the nearest cubic foot, what is the volume of a spherical tank with a radius of 32 ft?