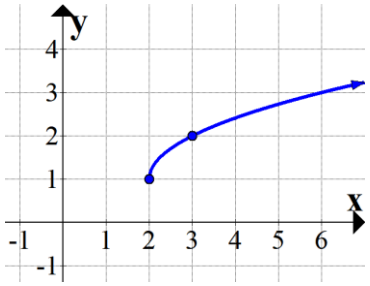
Honors Math 2 Name_____

Unit 3.3 WS graphing square & cube roots Period_____Date_____

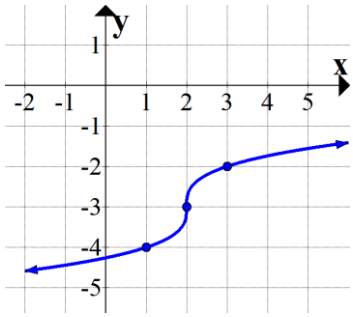
1. Complete this statement: Square roots functions and cube root functions are examples of _____ functions.

2. Explain why the graph shown at the near right is not the graph of $y = \sqrt{x-1} + 2$.



Problem 2

3. Explain why the graph shown at the far right in not the graph of $y = \sqrt[3]{x+2} - 3$.



Problem 3

Describe how to obtain the graph of $g(x)$ from the graph of $f(x)$.

4. $g(x) = \sqrt{x+5}$, $f(x) = \sqrt{x}$

5. $g(x) = \sqrt[3]{x} - 10$, $f(x) = \sqrt[3]{x}$

6. Biologists have discovered that the shoulder height h (in centimeters) of a male African elephant can be modeled by $h(t) = 62.5\sqrt[3]{t} + 75.8$. Use a graphing calculator to graph the model. Then use the graph to estimate the age of an elephant whose shoulder height is 250 centimeters.

Describe how to obtain the graph of $g(x)$ from the graph of $f(x)$.

7. $g(x) = \sqrt{x+14}$, $f(x) = \sqrt{x}$

8. $g(x) = 5\sqrt{x-10} - 3$, $f(x) = 5\sqrt{x}$

9. $g(x) = -\sqrt[3]{x} - 10$, $f(x) = -\sqrt[3]{x}$

10. $g(x) = \sqrt[3]{x+6} - 5$, $f(x) = \sqrt[3]{x}$

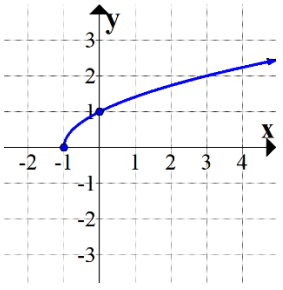
Match the function with its graph.

11. $y = \sqrt{x} - 1$

12. $y = \sqrt{x+1}$

13. $y = \sqrt{x+1} - 1$

A.



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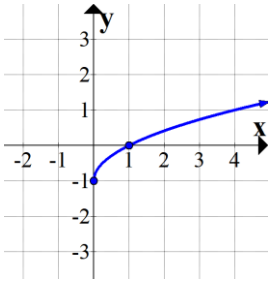

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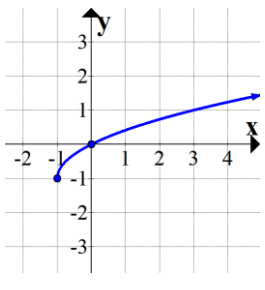
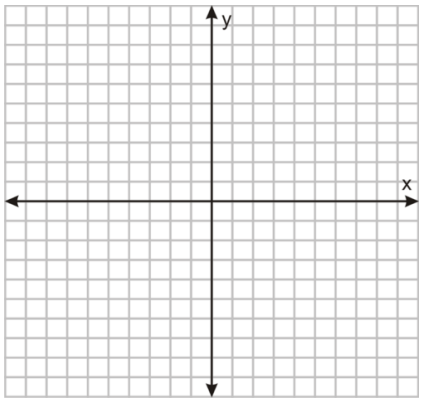


Graph the function. State the domain and range.

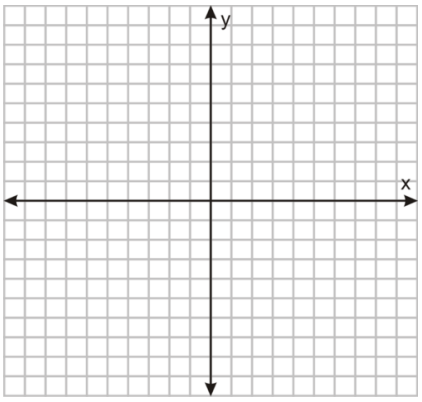
14. $y = 5\sqrt{x}$

Domain:
Range:



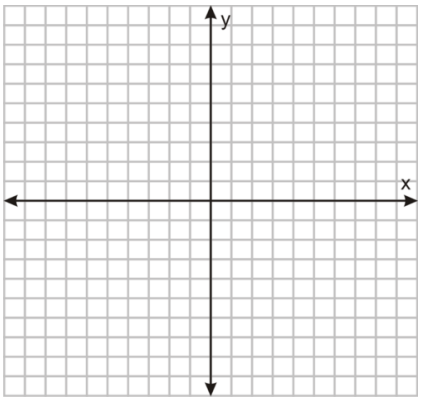
15. $y = x^{\frac{1}{2}} - 2$

Domain:
Range:



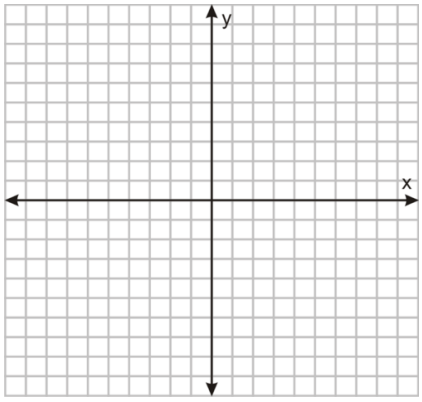
16. $y = \sqrt{x+6}$

Domain:
Range:



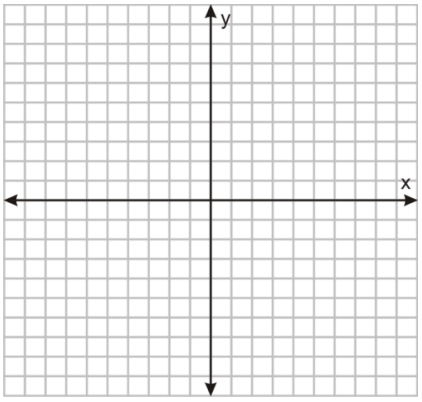
17. $y = -(x-1)^{\frac{1}{2}} + 7$

Domain:
Range:



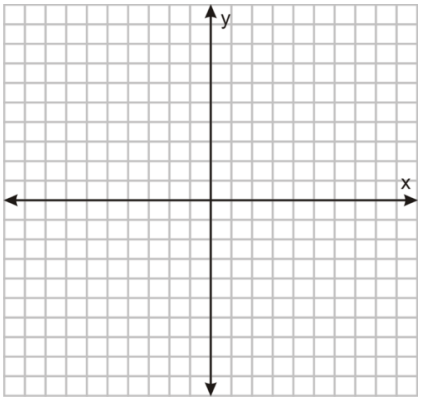
18. $y = 2\sqrt{x+5} - 3$

Domain:
Range:



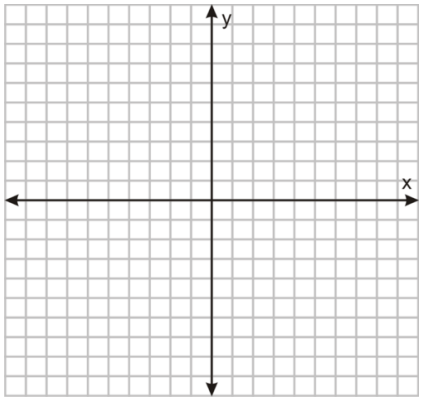
19. $y = -2x^{\frac{1}{3}}$

Domain:
Range:



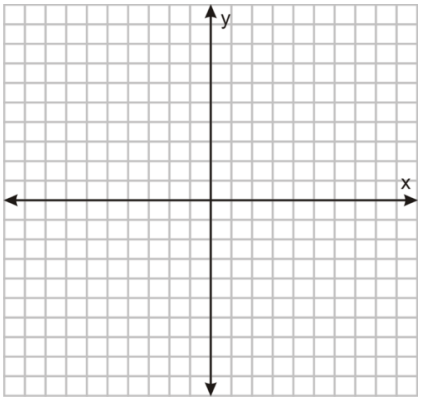
20. $y = (x+2)^{\frac{1}{3}}$

Domain:
Range:



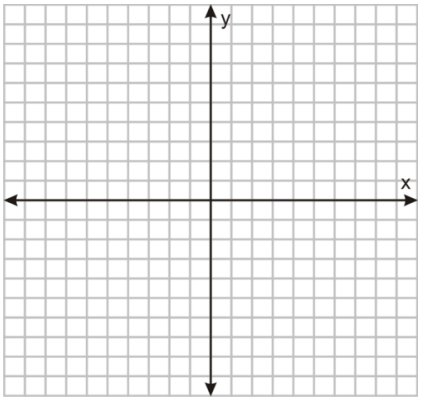
21. $y = -3\sqrt[3]{x+2}$

Domain:
Range:



22. $y = 2\sqrt[3]{x-4} + 3$

Domain:
Range:



Find the domain and range of the function without graphing.

23. $y = 2\sqrt{x} - 2$

Domain:
Range:

24. $y = -\sqrt{x-3} - 7$

Domain:
Range:

25. $y = \sqrt{x-13}$

Domain:
Range:

26. $y = \sqrt[3]{x+8}$

Domain:
Range:

27. $y = -\frac{2}{3}\sqrt[3]{x} - 5$

Domain:
Range:

28. $y = 4\sqrt[3]{x+4} + 7$

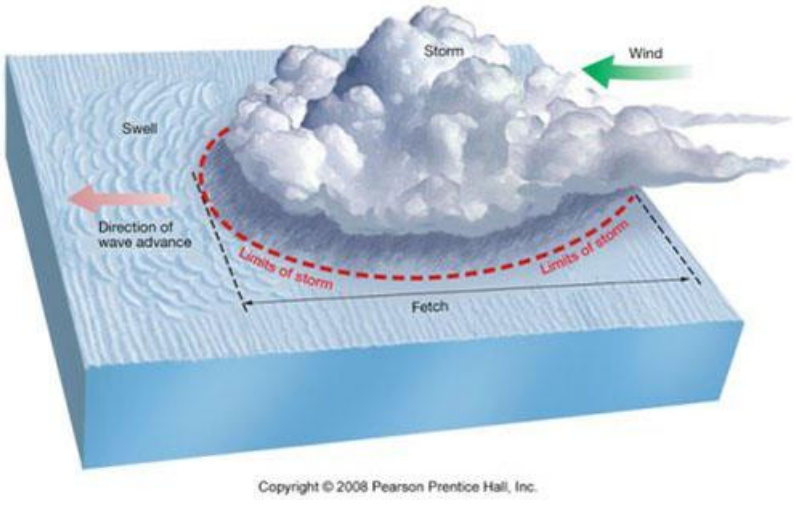
Domain:
Range:

In exercises 29-31, use a graphing calculator to graph the models. Then use the intersect feature to solve the problems.

29. When you look at the ocean, the distance d (in miles) you can see to the horizon can be modeled by $d = 1.22\sqrt{a}$ where a is your altitude (in feet above sea level). Graph the model and determine at what altitude you can see 10 miles.
Source: Mathematics in Everyday Things

30. Drag racing is an acceleration contest over a distance of a quarter mile. For a given total weight, the speed of a car at the end of the race is a function of the car's power. For a total weight of 3500 pounds, the speed s (in miles per hour) can be modeled by $s = 14.8\sqrt[3]{p}$ where p is the power (in horsepower). Graph the model. Then determine the power of a car that reaches a speed of 100 miles per hour. Source: The Physics of Sports

31. The fetch f (in nautical miles) of the wind at sea is the distance over which the wind is blowing. The minimum fetch required to create a fully developed storm can be modeled by $s = 3.1\sqrt[3]{f+10} + 11.1$ where s is the speed (in knots) of the wind. Graph the model. Then determine the minimum fetch required to create a fully developed storm if the wind speed is 25 knots. Source: Oceanography



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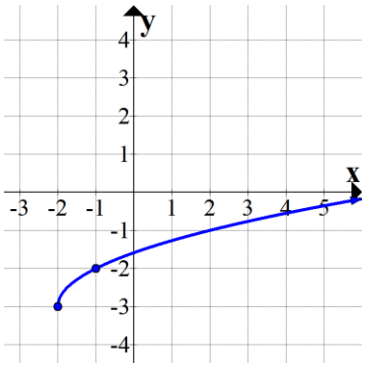
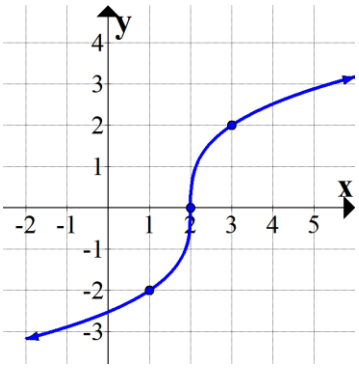
Write an equation for the function whose graph is shown.

32.



33.



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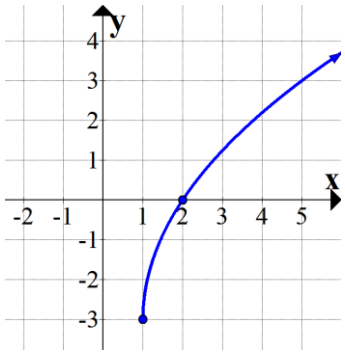


Solve the equations.

35. $2x^2 = 32$

36. $\frac{1}{2}x^2 - 5 = 13$

Find the product.

37. $(x + 4)^2$

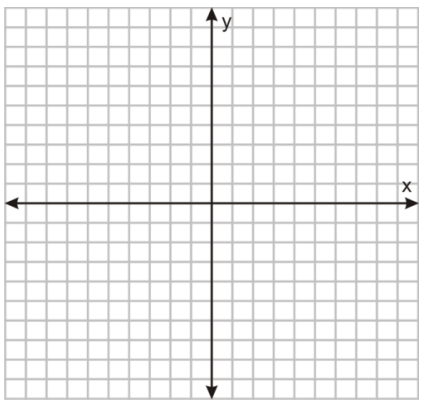
38. $(2x^3 + 7)^2$

***Graph. State the domain and range. Describe what is unique about these graphs compared to the graphs you have been doing.**

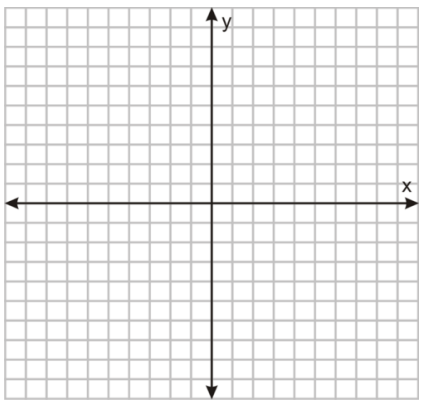
39. $y = 2\sqrt{3 - x} + 2$

Domain:

Range:



40. $y = \sqrt[3]{2x - 6} + 1$

Domain:

Range: