22. What is the domain of the function below?

$$f(x) = \sqrt[4]{3x-7}$$

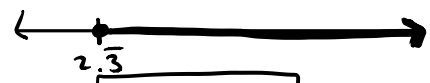
★ EVEN ROOT ⇒ RESTRICTED DOMAIN!

$3x - 7 \geq 0$

$3x \geq 7$

$x \geq \frac{7}{3}$

$x \geq 2.\overline{3}$



$\boxed{[2.\overline{3}, \infty)}$

A. $(-\infty, \infty)$

B. $[a, \infty)$, where $a \in [1.9, 3]$

C. $(-\infty, a]$, where $a \in [2.01, 3.75]$

D. $(-\infty, a]$, where $a \in [0.25, 0.87]$

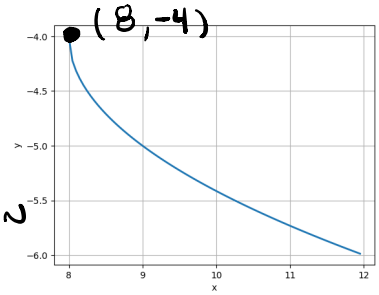
E. $[a, \infty)$, where $a \in [-2.4, 2.2]$

23. Choose the equation of the function graphed below.

★ $a < 0$
$\Rightarrow a = -1$

★ VERTEX IS
$(h, k) = (8, -4)$

★ EVEN ROOT FUNCTION



A. $f(x) = \sqrt{x-8} - 4$

B. $f(x) = -\sqrt{x-8} - 4$

C. $f(x) = -\sqrt{x+8} - 4$

D. $f(x) = \sqrt{x+8} - 4$

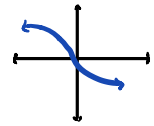
$f(x) = a\sqrt{x-h} + k = -1\sqrt{x-8} + (-4) = -\sqrt{x-8} - 4 \Rightarrow \boxed{f(x) = -\sqrt{x-8} - 4}$

24. Choose the graph of the equation below.

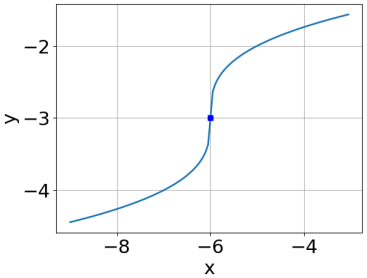
$$f(x) = -\sqrt[3]{x-6} - 3$$

★ $a = -1$
$\Rightarrow a < 0$

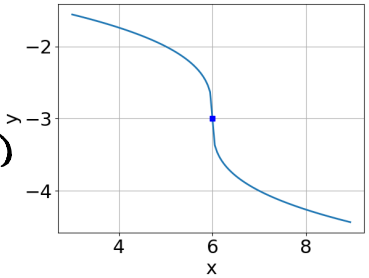
★ VERTEX IS
$(h, k) = (6, -3)$



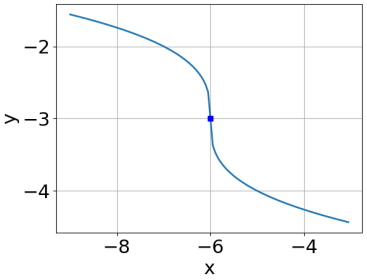
A.



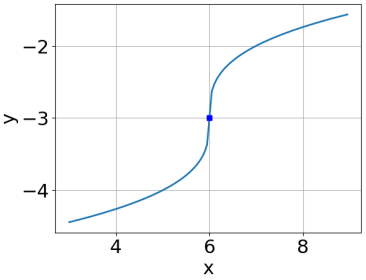
C.



B.



D.



25. Solve the radical equation below. Then, choose the interval(s) that the solution(s) belongs to.

$$\sqrt{2x+3} - \sqrt{5x-9} = 0$$

$\sqrt{2x+3} = \sqrt{5x-9}$

$(\sqrt{2x+3})^2 = (\sqrt{5x-9})^2$

$2x+3 = 5x-9$

$3 = 3x-9$

$12 = 3x$

$4 = x$

A. All solutions lead to invalid or complex values in the equation.

B. $x \in [-1, 5]$

C. $x_1 \in [-1, 5]$ and $x_2 \in [-3, 4]$

D. $x_1 \in [-1, 5]$ and $x_2 \in [-6, -1]$

E. $x \in [-5, -3]$

CHECK!

$\sqrt{2(4)+3} - \sqrt{5(4)-9} \stackrel{?}{=} 0$

$\sqrt{11} - \sqrt{11} \stackrel{?}{=} 0$

$0 = 0$ ✓ $\Rightarrow$ $\boxed{x=4 \text{ IS A SOLUTION!}}$

26. Solve the radical equation below. Then, choose the interval(s) that the solution(s) belongs to.

$$\sqrt{24x^2+40} - \sqrt{62x} = 0$$

A. $x_1 \in [-1.29, -1.2]$ and $x_2 \in [-1.8, -0.2]$

B. $x \in [1.19, 1.27]$

C. $x_1 \in [1.19, 1.27]$ and $x_2 \in [1.2, 1.6]$

D. All solutions lead to invalid or complex values in the equation.

E. $x \in [1.32, 1.38]$

$\sqrt{24x^2+40} = \sqrt{62x}$

$\left(\sqrt{24x^2+40}\right)^2 = \left(\sqrt{62x}\right)^2$

$24x^2 + 40 = 62x$

$24x^2 - 62x + 40 = 0$

$(24)(40) = 960$

★ $(-30)(-32) = 960$

AND

$(-30)+(-32) = -62$

$24x^2 - 32x - 30x + 40 = 0$

$8x(3x-4) - 10(3x-4) = 0$

$(3x-4)(8x-10) = 0$

$3x-4=0$ $\quad$ $8x-10=0$

$3x=4$ $\quad$ $8x=10$

$x=\frac{4}{3}$ $\quad$ $x=\frac{10}{8}$

$x=1.\overline{3}$ $\quad$ $x=1.25$

CHECK FOR EXTRANEOUS SOLUTIONS!

1. $x=1.\overline{3}$: $\sqrt{24(1.\overline{3})^2+40} - \sqrt{62(1.\overline{3})} \stackrel{?}{=} 0$

$\sqrt{42.\overline{6}+40} - \sqrt{82.\overline{6}} \stackrel{?}{=} 0$

$\sqrt{82.\overline{6}} - \sqrt{82.\overline{6}} \stackrel{?}{=} 0$

$0 = 0$ ✓

$\boxed{x=1.\overline{3}}$ IS A SOLUTION

2. $x=1.25$: $\sqrt{24(1.25)^2+40} - \sqrt{62(1.25)} \stackrel{?}{=} 0$

$\sqrt{77.5} - \sqrt{77.5} \stackrel{?}{=} 0$

$0 = 0$ ✓

$\boxed{x=1.25}$ IS A SOLUTION