

This is the Answer Key for Module 7 Version B.

31. Determine the domain of the function below.

$$\frac{4}{20x^2 - 41x + 20}$$

The solution is All Real numbers except $x = a$ and $x = b$, where $a \in [0.33, 0.91]$ and $b \in [0.97, 1.6]$

A. All Real numbers except $x = a$ and $x = b$, where $a \in [0.33, 0.91]$ and $b \in [0.97, 1.6]$

This is the correct option!

B. All Real numbers except $x = a$ and $x = b$, where $a \in [19.73, 20.01]$ and $b \in [19.73, 20.01]$

This corresponds to not factoring the denominator correctly.

C. All Real numbers except $x = a$, where $a \in [0.33, 0.91]$

This corresponds to removing only 1 value from the denominator.

D. All Real numbers except $x = a$, where $a \in [19.73, 20.01]$

This corresponds to removing a distractor value from the denominator.

E. All Real numbers.

This corresponds to thinking the denominator has complex roots or that rational functions have a domain of all Real numbers.

General Comments: The new domain is the intersection of the previous domains.

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

$$\frac{-5}{4 * x + 4} - -3 = \frac{7}{-16 * x - 16}$$

The solution is -0.729166666667

A. $x \in [0.84, 1.29]$

B. $x_1 \in [-0.27, 0.24]$ and $x_2 \in [-2, 0]$

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

D. $x_1 \in [0.84, 1.29]$ and $x_2 \in [-2, 0]$

E. $x \in [-0.89, -0.43]$

General Comments: Distractors are different based on the number of solutions. Remember that after solving, we need to make sure our solution does not make the original equation divide by zero!

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

$$-3 * x / (7 * x + 3) - 6 * x * 2 / (-42 * x * 2 + 31 * x + 21) = 5 / (-6 * x + 7)$$

The solution is $[7/3 + \text{sqrt}(241)/6, -\text{sqrt}(241)/6 + 7/3]$

A. $x_1 \in [4.6, 6.4]$ and $x_2 \in [-0.87, 0.16]$

B. $x \in [-4.5, 0.6]$

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

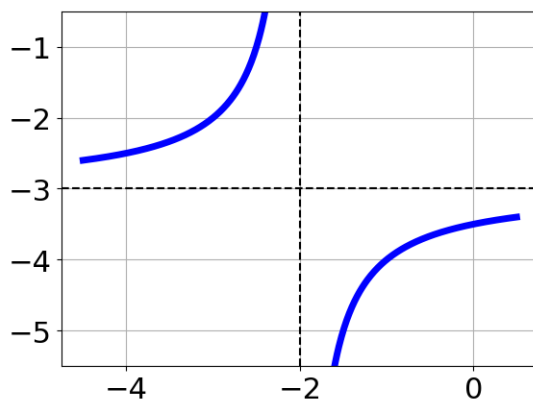
D. $x_1 \in [4.6, 6.4]$ and $x_2 \in [-1.54, -0.69]$

E. $x \in [0.6, 3.9]$

General Comments: Distractors are different based on the number of solutions. Remember that after solving, we need to make sure our solution does not make the original equation divide by zero!

34. Choose the equation of the function graphed below.

Graph of the function $f(x) = \frac{-1}{x+2} - 3$



The solution is $\frac{-1}{x+2} - 3$

A. $\frac{1}{(x-2)^2} - 3$

Corresponds to thinking the graph was a shifted version of $\frac{1}{x^2}$, using the general form $f(x) = \frac{a}{x+h} + k$, and the opposite leading coefficient.

B. $\frac{-1}{x+2} - 3$

This is the correct option.

C. $\frac{1}{x-2} - 3$

Corresponds to using the general form $f(x) = \frac{a}{x+h} + k$ and the opposite leading coefficient.

D. $\frac{-1}{(x+2)^2} - 3$

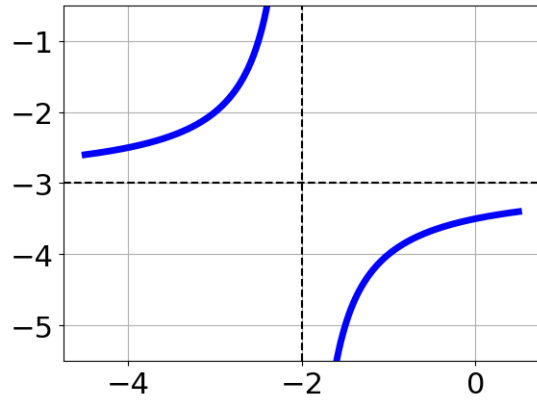
Corresponds to thinking the graph was a shifted version of $\frac{1}{x^2}$.

General Comments: Remember that the general form of a basic rational equation is $f(x) = \frac{a}{(x-h)^n} + k$, where a is the leading coefficient (and in this case, we assume is either 1 or -1), n is the degree (in this case, either 1 or 2), and (h, k) is the intersection of the asymptotes.

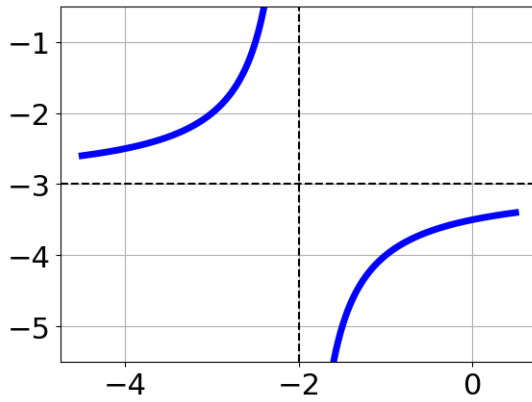
35. Choose the graph of the equation below.

$$\frac{-1}{x+2} - 3$$

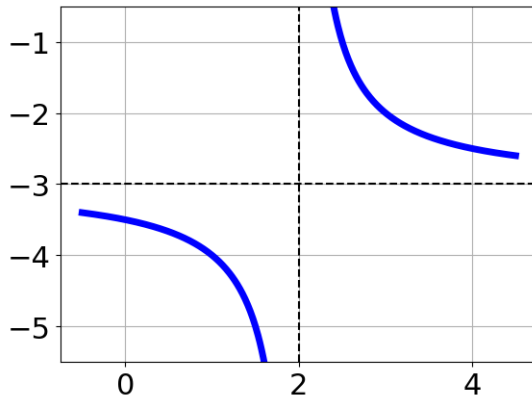
The solution is



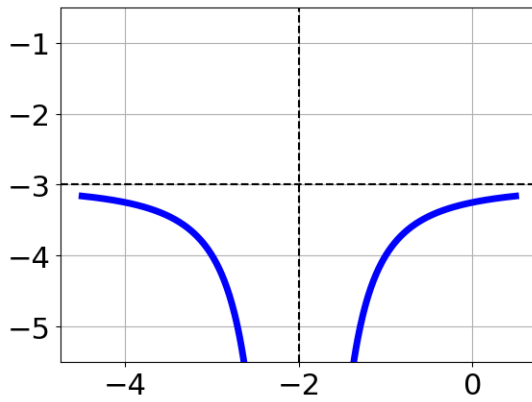
A.

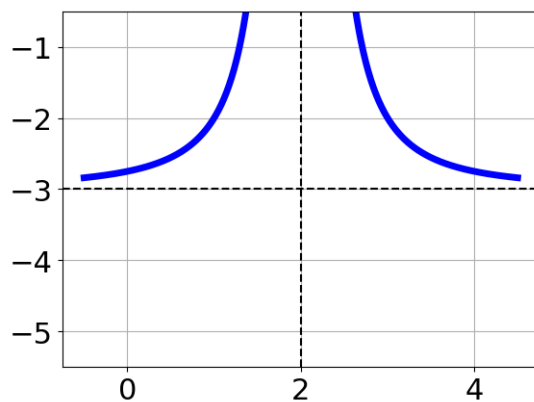


B.



C.





D.

General Comments: Remember that the general form of a basic rational equation is $f(x) = \frac{a}{(x-h)^n} + k$, where a is the leading coefficient (and in this case, we assume is either 1 or -1), n is the degree (in this case, either 1 or 2), and (h, k) is the intersection of the asymptotes.
