This is the Answer Key for Module 7 Version MU.

31. Determine the domain of the function below.

$$\frac{3}{18x^2+39x+15}$$

The solution is All Real numbers except $x=a$ and $x=b,$ where $a\in[-1.1,0.6]$ and $b\in[-2.1,-0.6]$

A. All Real numbers.

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

B. All Real numbers except $x=a,$ where $a\in[-1.1,0.6]$

This corresponds to removing only 1 value from the denominator.

C. All Real numbers except $x=a$ and $x=b,$ where $a\in[-1.1,0.6]$ and $b\in[-2.1,-0.6]$

This is the correct option!

D. All Real numbers except $x=a,$ where $a\in[-18.5,-17.9]$

This corresponds to removing a distractor value from the denominator.

E. All Real numbers except $x=a$ and $x=b,$ where $a\in[-18.5,-17.9]$ and $b\in[-16.1,-14.1]$

This corresponds to not factoring the denominator correctly.

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

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

$$\frac{4}{-8*x+5}--8=\frac{2}{-40*x+25}$$

The solution is 0.68125

A. $x\in[0.68,0.71]$

B. $x\in[-0.59,-0.56]$

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

D. $x_1\in[-0.59,-0.56]$ and $x_2\in[-1,1]$

E. $x_1\in[0.58,0.67]$ and $x_2\in[-1,1]$

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!

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

$$3*x/(4*x-5)-3*x**2/(-16*x**2+36*x-20)=-2/(-4*x+4)$$

The solution is $Allsolutionsareinvalidorleadtocomplexvaluesintheequation.$

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

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

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

D. $x\in[-5,5]$

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

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!

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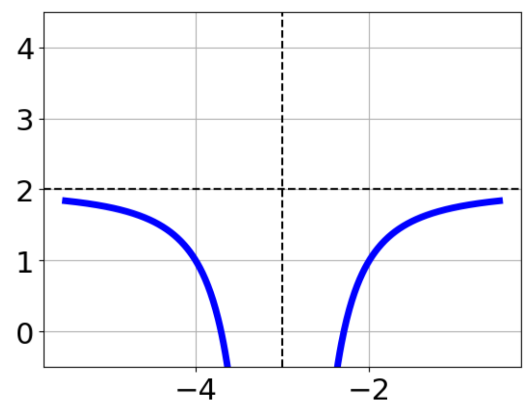
34. Choose the equation of the function graphed below.

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



The solution is $\dfrac{-1}{(x+3)^2} + 2$

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

   This is the correct option.

B. $\dfrac{1}{(x-3)^2} + 2$

   Corresponds to using the general form $f(x) = \dfrac{a}{(x+h)^2} + k$ and the opposite leading coefficient.

C. $\dfrac{1}{x-3} + 2$

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

D. $\dfrac{-1}{x+3} + 2$

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

General Comments: Remember that the general form of a basic rational equation is $f(x) = \dfrac{a}{(x-h)^n} + k$, 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.

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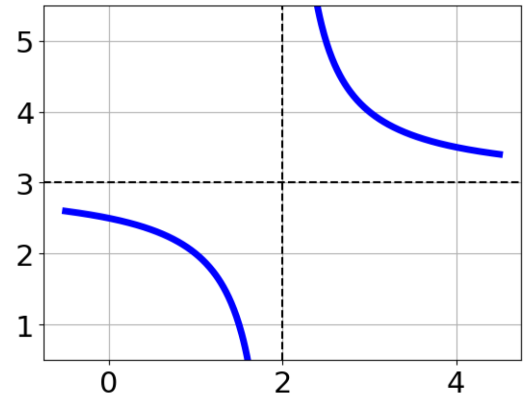
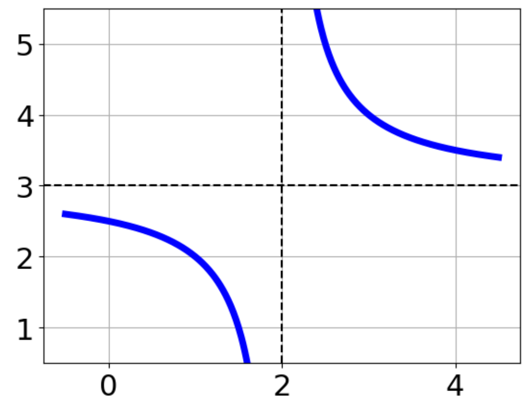
35. Choose the graph of the equation below.

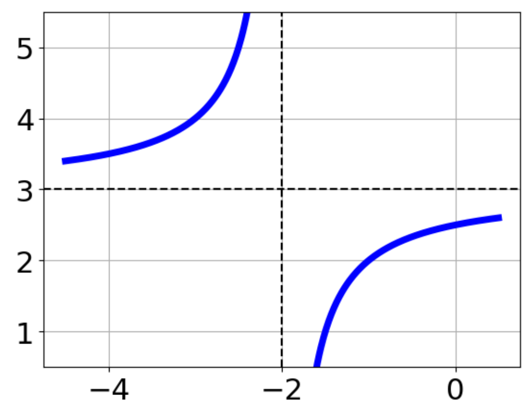
$$\frac{1}{x-2} + 3$$

The solution is

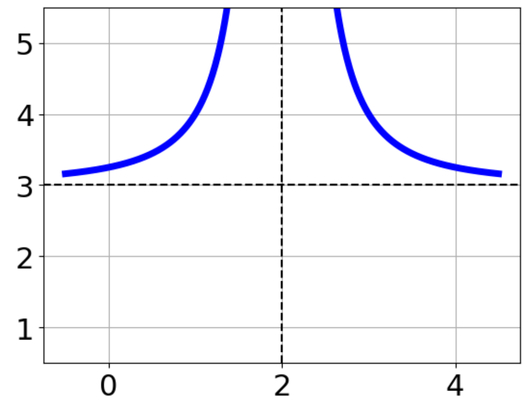




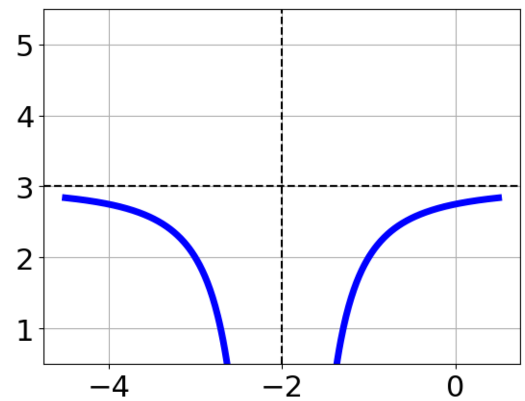
A.



B.



C.



D.

General Comments: Remember that the general form of a basic rational equation is $f(x) = \dfrac{a}{(x-h)^n} + k$, 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.
