

Determining which are Rational functions Practice 1

Problem 1 Consider the following rational function:

$$f(x) = \frac{(7x-1)^2 |3x-9| |-6x-7|}{(e^{(5x-7)} - 1) \sqrt{-2x-9} \log(|8x+3|+1)}$$

What is the sum of the domain restriction x-values? $-\frac{139}{40}$

Feedback(attempt): Start by finding all the zeros of the denominator. Notice that the denominator is already factored, so you can find the zeros by finding when each factor equals zero. Once you have those, add them up to find the sum!

Problem 1.1 What is the domain of this function?

$$\begin{aligned} &(-\infty, (-\frac{9}{2} \sqrt{\frac{7}{6}/\frac{1}{7}/-\frac{1}{7}/-\frac{3}{8}/-\frac{7}{6}/3/-3/\frac{7}{5}/\frac{3}{8}/\frac{9}{2}/-\frac{7}{5}})((/[]/)\checkmark) \cup \\ &((\sqrt{[]/}))(-\frac{9}{2} \sqrt{\frac{7}{6}/\frac{1}{7}/-\frac{1}{7}/-\frac{3}{8}/-\frac{7}{6}/3/-3/\frac{7}{5}/\frac{3}{8}/\frac{9}{2}/-\frac{7}{5}}), (-\frac{9}{2}/ \\ &\frac{7}{6}/\frac{1}{7}/-\frac{1}{7}/-\frac{3}{8} \sqrt{-\frac{7}{6}/3/-3/\frac{7}{5}/\frac{3}{8}/\frac{9}{2}/-\frac{7}{5}})((/[]/)\checkmark) \cup ((\sqrt{[]/}) \\ &)(-\frac{9}{2}/\frac{7}{6}/\frac{1}{7}/-\frac{1}{7}/-\frac{3}{8} \sqrt{-\frac{7}{6}/3/-3/\frac{7}{5}/\frac{3}{8}/\frac{9}{2}/-\frac{7}{5}}), (-\frac{9}{2}/\frac{7}{6}/\frac{1}{7}/-\frac{1}{7}/ \\ &-\frac{3}{8}/-\frac{7}{6}/3/-3/\frac{7}{5} \sqrt{\frac{3}{8}/\frac{9}{2}/-\frac{7}{5}})((/[]/)\checkmark) \cup ((\sqrt{[]/}))(-\frac{9}{2}/\frac{7}{6}/ \\ &\frac{1}{7}/-\frac{1}{7}/-\frac{3}{8}/-\frac{7}{6}/3/-3/\frac{7}{5} \sqrt{\frac{3}{8}/\frac{9}{2}/-\frac{7}{5}}), \infty) \end{aligned}$$

Feedback(attempt): You need to make sure to avoid the values that make the denominator zero. Thus make sure you use the excluding symbol (the parentheses) and the end points of the intervals should be the the values that you found as zeros in the denominator (in increasing order; order matters!)

Problem 2 Consider the following rational function:

$$f(x) = \frac{-2(8x+5)^3(7x+1)^2(x+5)}{(e^{(-4x-7)} - 1) |-x-3| |-5x+4|}$$

What is the sum of the domain restriction x-values? $-\frac{79}{20}$

Feedback(attempt): Start by finding all the zeros of the denominator. Notice that the denominator is already factored, so you can find the zeros by finding when each factor equals zero. Once you have those, add them up to find the sum!

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Problem 2.1 What is the domain of this function?

$$\begin{aligned} &(-\infty, (5/-\frac{5}{8}/\frac{5}{8}/-\frac{7}{4}/-5/-\frac{1}{7}/-3\sqrt{\frac{1}{7}/\frac{7}{4}/3/\frac{4}{5}/-\frac{4}{5}})((/[]/)\checkmark)\cup(\\ &(\sqrt{[]/})) (5/-\frac{5}{8}/\frac{5}{8}/-\frac{7}{4}/-5/-\frac{1}{7}/-3\sqrt{\frac{1}{7}/\frac{7}{4}/3/\frac{4}{5}/-\frac{4}{5}}), (5/-\frac{5}{8}/ \\ &\frac{5}{8}/-\frac{7}{4}\sqrt{-5/-\frac{1}{7}/-3/\frac{1}{7}/\frac{7}{4}/3/\frac{4}{5}/-\frac{4}{5}})((/[]/)\checkmark)\cup((\sqrt{[]/})) (5 \\ &/-\frac{5}{8}/\frac{5}{8}/-\frac{7}{4}\sqrt{-5/-\frac{1}{7}/-3/\frac{1}{7}/\frac{7}{4}/3/\frac{4}{5}/-\frac{4}{5}}), (5/-\frac{5}{8}/\frac{5}{8}/-\frac{7}{4}/-5/ \\ &-\frac{1}{7}/-3/\frac{1}{7}/\frac{7}{4}/3/\frac{4}{5}\sqrt{-\frac{4}{5}})((/[]/)\checkmark)\cup((\sqrt{[]/})) (5/-\frac{5}{8}/\frac{5}{8}/-\frac{7}{4} \\ &/-5/-\frac{1}{7}/-3/\frac{1}{7}/\frac{7}{4}/3/\frac{4}{5}\sqrt{-\frac{4}{5}}), \infty) \end{aligned}$$

Feedback(attempt): You need to make sure to avoid the values that make the denominator zero. Thus make sure you use the excluding symbol (the parentheses) and the end points of the intervals should be the the values that you found as zeros in the denominator (in increasing order; order matters!)

Problem 3 Consider the following rational function:

$$f(x) = \frac{(e^{-8x-7} - 1)\sqrt{|5x+9|}|3x-5|}{-5(7x+8)^2(x-1)|x+10|}$$

What is the sum of the domain restriction x-values? $\boxed{-\frac{71}{7}}$

Feedback(attempt): Start by finding all the zeros of the denominator. Notice that the denominator is already factored, so you can find the zeros by finding when each factor equals zero. Once you have those, add them up to find the sum!

Problem 3.1 What is the domain of this function?

$$\begin{aligned} &(-\infty, (\frac{9}{5}/-\frac{7}{8}/\frac{5}{3}/-10\sqrt{-\frac{9}{5}/10/\frac{7}{8}/1/-1/-\frac{8}{7}/-\frac{5}{3}/\frac{8}{7}})((/[]/)\checkmark) \\ &\cup((\sqrt{[]/})) (\frac{9}{5}/-\frac{7}{8}/\frac{5}{3}/-10\sqrt{-\frac{9}{5}/10/\frac{7}{8}/1/-1/-\frac{8}{7}/-\frac{5}{3}/\frac{8}{7}}), (\frac{9}{5}/ \\ &-\frac{7}{8}/\frac{5}{3}/-10/-\frac{9}{5}/10/\frac{7}{8}/1/-1/-\frac{8}{7}\sqrt{-\frac{5}{3}/\frac{8}{7}})((/[]/)\checkmark)\cup((\sqrt{[]/} \\ &/)) (\frac{9}{5}/-\frac{7}{8}/\frac{5}{3}/-10/-\frac{9}{5}/10/\frac{7}{8}/1/-1/-\frac{8}{7}\sqrt{-\frac{5}{3}/\frac{8}{7}}), (\frac{9}{5}/-\frac{7}{8}/\frac{5}{3}/ \\ &-10/-\frac{9}{5}/10/\frac{7}{8}/1\sqrt{-1/-\frac{8}{7}/-\frac{5}{3}/\frac{8}{7}})((/[]/)\checkmark)\cup((\sqrt{[]/})) (\frac{9}{5}/ \\ &-\frac{7}{8}/\frac{5}{3}/-10/-\frac{9}{5}/10/\frac{7}{8}/1\sqrt{-1/-\frac{8}{7}/-\frac{5}{3}/\frac{8}{7}}), \infty) \end{aligned}$$

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Feedback(attempt): You need to make sure to avoid the values that make the denominator zero. Thus make sure you use the excluding symbol (the parentheses) and the end points of the intervals should be the the values that you found as zeros in the denominator (in increasing order; order matters!)
