

Summer 2020 Math 115 Quiz 3 SHOW ALL WORK!

2 pts. 1. Evaluate the base-2 logarithmic expression. Find an exact value. $\log_2\left(\frac{1}{\sqrt{2}}\right) - \log_2 128 - \log_2 1$

2. 3 pts. Find a rational function $r(x)$ that satisfies ALL of these criteria:

- i. There are x intercepts at $x = -2$ and 2 .
- ii. There is a vertical asymptote at $x = 1$.
- iii. For the end behavior, as x approaches $-\infty$, $r(x)$ approaches 2 .

3. 3 pts. Which of the following functions are one-to-one? Select all that apply.

A. $f(x) = 2^x$

B. $f(x) = \frac{2x}{x+1}$

C. $f(x) = -x^2 + 2$

D. $f(x) = \frac{1}{2}|2x + 1|$

E. $f(x) = \sqrt{2x - 10}$

3 pts. 4. Write the function $h(x)$ as a composition of two non-identity functions $f(x)$ and $g(x)$, so that $h(x) = f \circ g(x)$.

$$h(x) = (4x^2 + 2x)^3$$

10 pts. 5. Find exact values. For the function $r(x) = \frac{2x^2 + 3x - 2}{5x - x^2}$

A. 1 pt. Find any vertical and horizontal asymptotes.

B. 1 pt. Find any x and y intercepts.

C. 2 pts. Graph the function. (Be sure to label the scale on your axes to provide a frame of reference for your graph.)

D. 3 pts. Describe the behavior of the function on each side of the vertical asymptotes.

E. 3 pts. Solve $r(x) \leq 0$. Write your answer in interval notation.

6. Use the following functions: $f(x) = -6x^2 + 4x - 7$ and $g(x) = \frac{-2x+3}{3x-7}$

2 pts. A. Find the composition $f \circ g(-1)$ exactly

3 pts. B. Find the inverse function $g^{-1}(x)$. Use the 3-step process outlined on page 384 of section 5.2.

4 pts. 7. Solve. $2x - 10 = \sqrt{4x + 4}$