Pre-Calculus: 2.7 – 2.8

Rational Functions and Solving Inequalities in One Variable

Name: _____

Date: _____ Hour: ____

SCORE: _____ /80

Percent Correct: _____%

Be sure to SHOW ALL WORK. Answer questions completely. Be sure to write answers in spaces provided. If work or answers are in another location, please make note of that. There are **80** points possible.
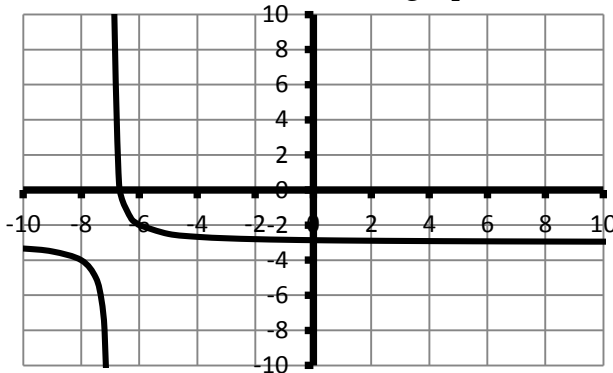
16/8/4	Correct, complete, with appropriate work or explanations.
12/6/3	Correct strategy, minor errors, appropriate work or explanations.
8/4/2	Starts with appropriate strategy, some understanding, some errors.
4/2/1	Attempted appropriate strategy, minimal understanding.
0	Little or no understanding evident – OR – no work shown.

1. Describe how the graphs of the given function can be obtained by transforming the graph of the rational function $f(x) = \frac{1}{x}$. **(8 points)**

$$f(x) = \frac{-8x + 3}{x - 2}$$

H – _____

S – _____

R – _____

V – _____

2. Evaluate the limit based on the graph $f(x)$ shown. **(8 points)**

$$\lim_{x \to -7^+} f(x) = \underline{\quad}$$

$$\lim_{x \to -7^-} f(x) = \underline{\quad}$$

$$\lim_{x \to \infty} f(x) = \underline{\quad}$$

$$\lim_{x \to -\infty} f(x) = \underline{\quad}$$

3. Solve the following equation algebraically. **(12 points)**

$$\frac{1}{x - 4} + \frac{x}{x - 2} = \frac{2}{x^2 - 6x + 8}$$

Solution: _____

4. For the given functions, find the indicated values. **(12 points)**

   A. $f(x) = \dfrac{4x+3}{x^2-16}$

   B. $f(x) = \dfrac{x^2-5x-36}{x+3}$

   X-Intercepts: _____ Y-Intercept: _____ | VA: _____ HA: _____ Slant A.: _____

For the following problems you are **REQUIRED** to make a sign chart for <u>full credit.</u>

5. Determine the x values that cause the polynomial functions to be **(a)** zero, **(b)** positive, and **(c)** negative. **(8 points)**

   $f(x) = (x-7)(3x+4)(x^2+6)$ $\longleftarrow \qquad\qquad\qquad\qquad\qquad \longrightarrow$

   (a):_____ **(b):**_____ **(c):**_____

6. Determine the x values that cause the polynomial function to be **(a)** zero, **(b)** undefined, **(c)** positive, and **(d)** negative. **(12 points)**
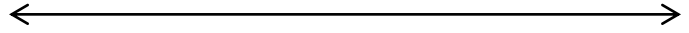
   A. $f(x) = \dfrac{(3x-6)(x+9)}{x-7}$ $\longleftarrow \qquad\qquad\qquad\qquad\qquad \longrightarrow$

   (a):_____ **(b):**_____ **(c):**_____ **(d):**_____

7. Solve the polynomial inequality. **(12 points)**

   A. $2x^3 - 25x^2 + 33x + 270 > 0$ $\longleftarrow \qquad\qquad\qquad\qquad\qquad \longrightarrow$

   Solution: _____

B. $\dfrac{\sqrt{x-8}}{x^2+17x+30} \le 0$ ←————————————→

Solution: _____

8. Answer the following questions in <u>complete</u> sentences. **(8 points)**

   A. When is a polynomial function undefined? (HINT: There are two cases).

      I.

      II.

   B. How do we find horizontal asymptotes? (**Give an example of each!**)