MAC 1140, Fall 2017

Exam #2

October 16, 2017

Name _____

- You will be told when to begin the work and when to terminate work on the examination. You must stop when instructed. Points may be deducted in case of violations.
- Please show your work to support your answers that require calculations. Correct but unsupported answers may not be given full credit.
- The use of a cell phone or other electronic communication devices during the examination is not allowed. The exam will be canceled and a grade of "0" will be assigned to anyone who uses a cell phone during the examination or if one is found within hands reach.
- Calculators are not allowed on this exam.
- The exam consist of two parts. Part I contains four multiple choice questions worth 6 points each. Part II contains four open ended questions worth 21.5 points each if not stated otherwise.

Part I

Choose your answer from five available choices. No partial credit will be given for wrong answers.

1. List potential rational zeros of the polynomial function $f(x) = 3x^4 - x^2 + 4x - 4$

   (a) $\pm 1, \pm 2, \pm 4, \pm\frac{1}{3}, \pm\frac{2}{3}, \pm\frac{4}{3}$

   (b) $1, 2, 4, \frac{1}{3}, \frac{2}{3}, \frac{4}{3}$

   (c) $\pm 1, \pm 3, \pm\frac{1}{2}, \pm\frac{1}{4}, \pm\frac{3}{2}, \pm\frac{3}{4}$

   (d) $1, 3, \frac{1}{2}, \frac{1}{4}, \frac{3}{2}, \frac{3}{4}$

   (e) None of the above

2. Which is the following functions are polynomial functions

   - $f(x) = \frac{2}{3}x^4 - 1$
   - $g(x) = \frac{2-x}{x-1}$
   - $h(x) = \frac{2x^5}{5} - 3x^2 + 2x - 6$
   - $k(x) = 3x - 2x^{1/2}$

   (a) f, g, and k

   (b) f

   (c) f and h

   (d) f, h, and k

   (e) None of the above

3. Find vertical asymptotes of the rational function

$$f(x) = \frac{x^2 + x - 6}{(x-1)(x+3)}$$

   (a) $y = 1$ and $y = -3$

   (b) $x = 1$ and $x = -3$

   (c) $y = 1$

   (d) $x = 1$

   (e) None of the above

4. -3 and $1 - 2i$ are zeros of a polynomial function. Which of the following is also a zero:

   (a) $1 + 2i$

   (b) $-1 - 2i$

   (c) $-1 + 2i$

   (d) 3

   (e) None of the above.

Part II

5. Graph the function $f(x) = \dfrac{x^3 - 4x}{x^2 - 1}$

   (a) Domain

   (b) y–intercept

   (c) x–intercept

   (d) Vertical asymptote

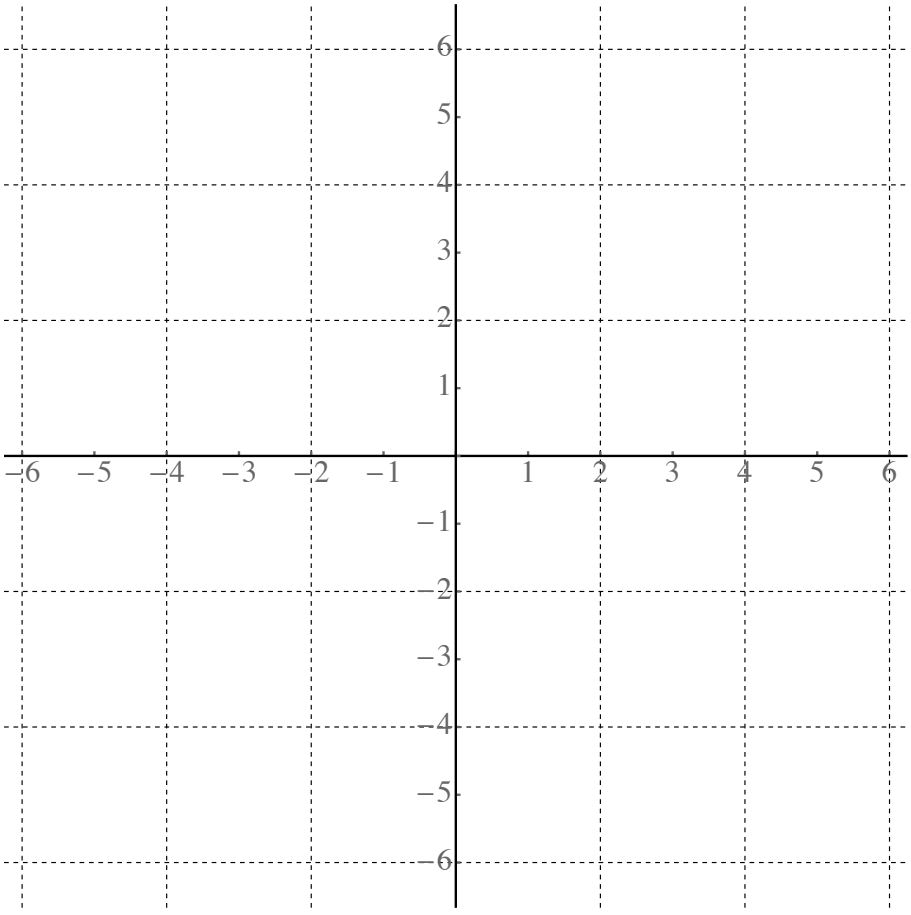
   (e) Horizontal/oblique(slant) asymptote

   (f) Intersection with asymptote

(g) Symmetries

(h) Sign chart

(i) Graph



6. Solve

$$x^3 = 9x - 10$$

7. Find the domain of $f(x) = \sqrt{2 - \dfrac{4}{x-3}}$

8. Solve

$$2x^2 + 3 \leq 5x$$

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