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The solutions to the document are provided at the Review. For more information on Reviews or our other services please go to www.teachingcenter.ufl.edu.

- 1) What is the domain of the following function...

$$\sqrt{\frac{x}{x^2 - 2x - 35}}$$

- 2) Write the equation of parabola with vertex $(-3,2)$ and going through the point $(1,34)$.
- 3) What is the vertex of a parabola with intercepts $(-6,0)$, $(2,0)$, and $(0,3)$?
- 4) Find all values of k such that the equation $x^2 + kx + 1 = -3$ has no real solutions.
- 5) Suppose the weekly Profit for Gator Gadgets, a popular local novelty store, depends on the number of novelty unit produced each week. Now, suppose that the Profit can be modeled by the function $P(x) = -3x^2 + 7x + 480$ where x is the number of novelties produced in thousands per week. How many novelties should Gator Gadgets produce in order to maximize profit?

- 6) Simplify the complex valued expressions...

a)

$$\frac{5}{i^3}$$

c)

$$-\frac{2i}{2+i} + \frac{i}{3-2i}$$

b)

$$(2+3i)^2$$

d)

$$\frac{(3+\sqrt{-4})(4-\sqrt{-9})}{\sqrt{-5}\sqrt{-20}}$$

- 7) Solve for x : $(x - (3 - 2i))(x - (3 + 2i)) = 5 - 6x$
- 8) Graph the following rational function given $x = 3/2$ is a zero. Include in your graph the x-intercepts, y-intercepts, the holes, the vertical asymptotes and the horizontal asymptotes.

$$g(x) = \frac{2x^3 - 5x^2 - 9x + 18}{x^3 - 2x^2 - 9x + 18}$$

- 9) Evaluate $f(3)$ if $f(x) = -6x^6 + 20x^5 - 3x^4 - 21x^2 - 20x - 2$.
- 10) If the polynomial $f(x)$ with only real coefficients has the following zeros (multiplicities shown in parenthesis), what is the smallest degree of $f(x)$?

$$x = 0 (3), \quad x = -2 + 3i (4), \quad x = 3 + 7i (1), \quad x = -2 (1)$$

- 11) Perform Long Division on the rational function.

$$f(x) = \frac{-9x^3 - 2x + 24}{3x^2 - 2x + 5}$$

- 12) Solve the systems:

$$(a) \begin{cases} 2x - 4y = 6 \\ 7x + 3y = 4 \end{cases}$$

$$(b) \begin{cases} \frac{3}{4}x - \frac{2}{3}y = -1 \\ -9x + 8y = 12 \end{cases}$$

$$(c) \begin{cases} x^2 + y^2 = 10 \\ 2y - x = -1 \end{cases}$$



13) Solve the following inequalities; write the answers in interval notation.

a)

$$x(x - 1)^2(x + 2)^3(2x + 1)^4 < 0$$

b)

$$x^3 - 9x - 2 \geq 2x^2 - 20$$

c)

$$\frac{3x}{x - 1} \leq \frac{x}{x + 4} + 3$$

14) The monthly revenue achieved by selling x tins of Mary's Holiday Fudge is calculated to be $x(50 - 0.5x)$ dollars. The wholesale cost of each batch is \$15. How many batches must be sold to achieve a profit (revenue - cost) of at least \$600.

15) It takes a math teacher 10 minutes to walk from his office to his class 300 ft away while classes are letting out. When his own class lets out, he is able to walk with the flow of traffic, getting to his office in 15 minutes. Assuming the speed of the math teacher and the collective speed of students walking from class is constant, what are the two speeds?

16) At a local fast food joint four large slices of pizza and two root beers cost a total of \$7.90. Two root beers cost 15 cents more than one large slice of pizza. How much would one slice of pizza with one root beer cost?