

Math 170
Chapter 3 Review
Ms. Meier

- 1) Given $f(x) = 5x^2 - 30x + 49$ express the quadratic function in standard form. State the vertex and graph. Find the minimum value.
- 2) Given $R(x) = 23500x - 1000x^2$ where $R(x)$ is the revenue in dollars from selling tickets to a concert at price x . What ticket price results in the maximum revenue? What is the maximum revenue?
- 3) Sketch by hand: $f(x) = x^3(x-1)(x+1)^2$
- 4) Divide $x^3 + 2x^2 - 3x + 1$ by $x + 2$
- 5) Find a fourth degree polynomial function with zeros of $x = -3, 1$, and 2
- 6) Given $f(x) = x^6 - 2x^5 - x^4 + 4x^3 - x^2 - 2x + 1$ how many possible rational zeros can this function have? List them
- 7) Find the exact zeros of $f(x) = x^3 - 6x + 4$
- 8) Find the exact zeros for $f(x)$, and put into factored form,
 $f(x) = 2x^5 - 10x^3 + 12x - x^4 + 5x^2 - 6$
- 9) Given $a = 3 + 2i$ and $b = 7 - 2i$ find each.... $a + b$, $a - b$, ab , a/b
- 10) Given that $x = i$ is a zero, find all zeros of $f(x) = x^4 - 8x^3 + 21x^2 - 8x + 20$
- 11) Find all asymptotes of $P(x) = \frac{x^2 + 1}{2x^2 - 5x - 3}$
- 12) Sketch $f(x) = \frac{4x^3 - 8x^2 + x + 3}{x^3 + x^2}$ include all key details, intercepts, asymptotes

Answers:

1) Standard form: $y = 5(x - 3)^2 + 4$, vertex (3,4) , minimum value is 4

2) the ticket price of \$11.75 yields the maximum revenue of \$138,062.50

3) degree 6 thus end behavior is that both ends go up, passes through (0,0) and (1,0) bounces off the point (-1,0)

4) $x^2 - 3 + \frac{7}{x+2}$

5) (3 possible answers) $y = x^4 - x^3 - 7x^2 + 13x - 6$ or $y = x^4 + 3x^3 - 7x^2 - 15x + 18$ or $y = x^4 - 2x^3 - 7x^2 + 20x - 12$

6) 2 possible zeros ; 1 and -1

7) $x = 2$ and $x = -1 \pm \sqrt{3}$

8) Zeros are $\frac{1}{2}, \pm\sqrt{2}, \pm\sqrt{3}$, $f(x) = (2x - 1)(x^2 - 2)(x^2 - 3)$

9) 10, $-4 + 4i$, $25 + 8i$, $17/53 + 20/53 i$

10) Zeros are $\pm i, 4 \pm 2i$ note $f(x)$ factors to $f(x) = (x^2 + 1)(x^2 - 8x + 20)$

11) Horizontal Asymptote: $y = \frac{1}{2}$, Vertical asymptotes $x = -1/2$ and $x = 3$

12) H.A. $y = 4$, V.A. $x = 0, x = -1$, no y-intercept, x-intercepts at $x = 1, x = 1.5, x = -0.5$