College Algebra Chapter 3 Review A

1. Sketch the graph of the quadratic function $f(x) = -3x^2 - 6x - 5$. Give the x and y intercepts, the vertex, the axis and the domain.

Use synthetic division to divide

2. $\dfrac{3x^4 + 2x^3 - x^2 + 5x - 6}{x + 2}$

3. $\dfrac{2x^3 + 4x - 5}{x - 3}$

4. Use synthetic division to determine f(2) given that $f(x) = 3x^5 + 4x^4 - 2x^2 + 7x - 13$.

5. Factor into linear factors given that k is a zero. $f(x) = x^4 + 2x^3 - 7x^2 - 20x - 12$; $k = -2$

6. Find all rational zeros of $f(x) = x^3 - 19x + 30$ given that k = -5 is a zero.

7. f(x) is a third degree polynomial having only real coefficients. It has 3, 1, and -2 as zeros and the point (2, 8) lies on its graph. Find f(x).

Graph each of the polynomials. Show the intercepts and enough other points to accurately show the relative max/min and end behavior.

8. $f(x) = (x + 1)(x - 2)(x - 4)$

9. $f(x) = -x^4 + 2x^3 - 2x^2$

10. $f(x) = (x - 1)(x - 3)(x + 2)^2$

11. Write an equation for a function with the following features:

x-intercepts: 5 and 3 y-intercept: 15 vertical asymptote: x = 1

horizontal asymptote: y = 1

Find all the asymptotes and/or holes of the following functions and sketch their graphs. Accurately graph the asymptotes, intercepts, and have at least 2 accurately drawn points on each side of each vertical asymptote.

12. $f(x) = \dfrac{3x + 3}{(x + 1)(x - 4)}$

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

14. $f(x) = \dfrac{x^2 - 4}{x}$

15. $f(x) = \dfrac{4x}{(x - 2)(x + 1)}$

16. $f(x) = \dfrac{x + 1}{x^2 - 9}$

17. In the following formula, y represents the minimum number of hours of studying required to attain a test score of x. $y = \dfrac{0.47x}{100.5 - x}$ How many hours of study are needed to score a 96?

18. If r varies jointly as m and n^2, and r = 72 when m = 4 and n = 6, find r when m = 3 and n= 4.

19. If p varies inversely as q^2, and p = 4 when q = ½ , find p when q = 3/2.

20. If y varies directly as the square of z and y = 8 when z = 6, find y when z = 9