Unit 1B Review

For the functions below:

- Determine/state the excluded values and domain of the function
- Determine/state the location of any vertical, horizontal or slant asymptotes
- Determine/state the coordinates of any holes
- Determine/state the coordinates of any x intercepts
- **If any of the above does not exist on the graph, please say so**

1) $f(x) = \dfrac{x^3 - 4x}{x^2 - 3x - 10}$

2) $f(x) = \dfrac{4x^2 - 13x + 3}{x^2 + 8x - 33}$

Unit 1B Review

Solve the following equations, **Please note any extraneous solutions**

1) $1 = \frac{n-2}{n-1} + \frac{3}{n^2+3n-4}$

2) $1 = \frac{2}{r^2} - \frac{1}{r}$

Solve the following inequalities, quantify your answer in interval notation

3) $(x + 4)^2(x - 1)^2(x - 6) < 0$

4) $4m^3 + 7m^2 - 2m > 0$

5) $\frac{4}{x-1} \geq \frac{3}{x-7}$

6) $\frac{3}{x-2} \leq \frac{3}{x+3}$

Unit 1B Review

Simplify the following:

25) $(-3+3i)^2$

26) $(-3+6i)(5-6i)$

29) $(3i)(-3-4i)(7-5i)$

30) $(-7i)(-2+7i)(2+6i)$

39) $\dfrac{-7+i}{-6-8i}$

40) $\dfrac{-2+i}{-1-8i}$

37) $\dfrac{8}{-4-2i}$

38) $\dfrac{6i}{9-9i}$

Solve the following for all real/complex solutions

1) $x^4-5x^2-36=0$

2) $x^3+3x^2-14x-20=0$

5) $x^4+6x^2+8=0$

9) $x^3-2x^2-3x+6=0$

Unit 1B Review

Write the equation of the polynomial that has the following zeros:

a. -3 mult. 2, $2\sqrt{2}$

b. $-3+2i$, $-2-2i$

Use the zero(s) given to determine all other zeros to the polynomial equation:

a. $f(x) = x^4 - 3x^3 + 6x^2 + 2x - 60$; $1 + 3i$

b. $g(x) = x^3 - 7x^2 - x + 87$ $5 + 2i$

Unit 1B Review

- What is the difference between a real and a complex number. Give an example of each

- What is the relationship between the domain of a rational function and its discontinuities? What are the two types of discontinuities that can be present on a rational function graph?

- What is an extraneous solution? What types of functions have extraneous solutions and why? Describe how you can check for extraneous solutions

- Describe how to find the location of a Horizontal Asymptote of a rational function

Factor each to linear factors. One zero has been given.

19) $f(x) = 5x^5 + 49x^4 + 125x^3 + 113x^2 + 22x - 10;\ -4 + \sqrt{6}$

Unit 1B Review

Solve the following AV equations, identify any extraneous solutions

a. $-3|x-1|-6=3$

b. $\frac{1}{4}|2x-6|+1=2$

c. $|2x+3| = 3x+2$

d. $-5|3+4k| = -115$

Solve the following AV inequalities and graph the solution on a number line.

a. $2|x-9|+6 > 6$

b. $3\left|\frac{1}{2}x+2\right|+6 < 15$

c. $-4|3x-1| \geq 8$

d. $\frac{|2+3x|}{2} \geq 5$