Unit 4 Summative Assessment Part 1 (Period 5)

Unit 1

1. Solve the following systems of equations

$$\begin{cases} 2x+y-3z=-1 \\ 4x+3y+z=\frac{4}{3} \\ 2x+6y-z=-\frac{5}{6} \end{cases}$$

2.

(a) Let $f(x)=-\frac{2}{3}|x-5|+2$, find x-intercepts and y-intercept algebraically.

(b) graph $f(x)$, verify your findings of intercepts from (a) .

3.

(a)Graph $\begin{cases} x-y\geq 3 \\ 4x+3y\leq -6 \end{cases}$ and

(b)find the coordinates of intersection of the boundary lines.

Unit 2

4. Let $g(x)=\frac{2}{3}x^2-4x-2$, $h(x)=-4x-2$

(a) Use "Completing the square" to re-write g(x) in the vertex form

(b) Solve $g(x)=h(x)$, if $x\in\mathbb{C}$.

(c) Graph g(x) using the result from (a) and identify the following characteristics

(i) Opening

(ii) Axis of symmetry

(iii) coordinates of the vertex

(iv) coordinates of the x-intercepts

(v) coordinates of the y-intercept

(d) Graph h(x) on the same coordinate plane with g(x). Explain and verify the solutions you found from question (b).

5. $z_1=1+i$, $z_2=-2i$

if $z_3=z_1+z_2$, $z_4=z_1z_2$ then

(a) rewrite z_3 , z_4 and $\frac{z_3}{z_4}$ in standard form

(b) rewrite $\frac{1}{z_1}+\frac{1}{z_2}$ in standard form

(c) verify that $\frac{1}{z_1}+\frac{1}{z_2}=\frac{z_3}{z_4}$

(d) Find $|z_3|$, $|z_4|$ and $\left|\frac{z_3}{z_4}\right|$

(e) Use result from (d) and verify $\left|\frac{z_3}{z_4}\right|=\frac{|z_3|}{|z_4|}$

(f) Write a conjecture statement about the finding from (e).

(g) Prove algebraically that statement from (e) is always true as long as z_4 is not zero in length. (Hint: Assume $z_3=a_1+b_1i$ and $z_4=a_2+b_2i$, then reason algebraically to show your conjecture from (f) is true).

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Unit 3

6. Use GRASP Template to solve the world problem.

Jelly Beans

In a display at Santana Row there is a candy jar full of blue, green and red jelly beans. The total weight of the candy jar with the beans is 50 grams. On average, every blue jelly bean weights 0.15 grams, every green jelly bean weights 0.09 grams and every red jelly bean weights 0.10 grams. After counting the beans Josiah found out that the numbers of the blue jelly beans is 25% more than the total numbers of the green and red jelly beans combined. He also found out that there are 225 jelly beans in the jar. If the weight of the green and red jelly beans combined is 9.43 grams less than the weight of the blue jelly beans, what is the weight of the jar alone?

7. Factor the following expressions completely

a) $6xy^2 + y^3 + 9x^2y$

b) $a^3 - 3a^4b + 3ab^4 - b^3$

8. Use long Division to divide the two polynomials: $(x^6 + 4x^3 - x^2 - 1) \div (x^2 + 1)$

9. Given $m(x) = 1 - 2x$, $n(x) = x - 3x^2 + 1$

a) find $m(x) \cdot n(x)$

b) find $m(x) - n(x)$

Unit 4

10. If the degree of polynomial $f(x)$ is 4 and all coefficients of $f(x)$ are rational numbers. Find the remainder of $f(x) \div (x+2)$ if the y-intercept of $f(x)$ is (0, 66) and some of zeros of $f(x)$ are $\sqrt{3} - 5, -3$ and $-\frac{1}{2}$

11. Find all possible zeros (including the complex and irrational zeros) for $k(x) = 12x^4 + 29x^3 + 3x^2 - 29x - 15$

12. Let $p(x) = 2x^3 + ax^2 + bx + 3$. If the remainder of $p(x) \div (x+1)$ is -5 and the remainder of $p(x) \div (x+3)$ is 33 , find all zeros for $p(x)$.