

## MHF4U j1+ B – Polynomial Functions Assignment

Answer all questions with full solutions. Make sure your work is legible, even after you have scanned it, and submit it as a single file.

1. Determine the remainder of the following polynomial divisions using the remainder theorem. If the binomial is a factor of the polynomial, determine the remaining factors.

**(5 marks)**

- a.  $2x^3 + 3x^2 - 29x - 60$  divided by  $(x-2)$
- b.  $x^3 - 4x^2 + x - 6$  divided by  $(x+2)$
- c.  $3x^3 - 5x^2 - 16x + 12$  divided by  $(x+2)$

2. Factor each of the following polynomials: **(6 marks)**

- a.  $36x^3 - 12x^2 + x$
- b.  $81x^4 - 16y^4$
- c.  $2x^3 + 16y^3$
- d.  $2w^2 - 4 - w$

3. If  $(a-3)$  divides evenly into  $a^3 - a^2 - ka + k$ , find  $k$ . **(2 marks)**

4. If  $4 - kx - x^2$  is divided by  $(x-4)$ , the remainder is -4. Find  $k$ . **(2 marks)**

5. Given the polynomial  $P(x) = 3x^4 - x^3 - 8x^2 - 4x$ , **(3 marks)**

- a. Is  $3x + 2$  a factor?
- b. Find all of the factors of this polynomial.

6. Given any quadratic function of the form  $f(x) = ax^2 + bx + c$ , explain how many roots are possible. Include a graph to illustrate your answer, and a possible function for each situation. **(2 marks)**

7. Find four consecutive even integers, such that the product of the first and second integers minus 8 is equal to the product of the third and fourth integers. **(3 marks)**

8. Solve  $(x-1)^2 - 20 = -4$ . **(2 marks)**

GO TO: THE DROPBOX AND UPLOAD YOUR WORK.

9. Use an interval chart to solve the following inequalities, state your answer in interval form: **(6 marks)**

a.  $\frac{x+2}{x-5} \geq \frac{x-3}{x+4}$

b.  $x^2 - x - 6 \leq 0$

c.  $x^3 + 5x^2 - 4x - 20 > 0$