Math 010 Practice Problems for Test 3 Fall 2022

The following are examples of potential exam questions. It is recommended that you show all work while doing these problems. No problem requires a calculator but you are welcome to use one.

1. Addition and subtraction with polynomials
   Examples:

   (a) Simplify $(7y^2 - 2y + 9) + (2y^2 - 3y + 2)$

   (b) Simplify $(7y^2 - 2y + 9) - (2y^2 - 3y + 2)$

   (c) Simplify $(2x^3 + 3) + (17x^2 - 3x + 4)$

   (d) Simplify $(3x^3 + 2x^2 + 4) - (3x^2 + 4x - 2)$

2. Multiplication with polynomials
   Examples:

   (a) Simplify $(5x)(2y)$

(b) Simplify $(x+1)^2$

(c) Simplify $(5x+3)(2x-2)$

(d) Simplify $(x+1)(x^2+3x+1)$

(e) Simplify $(4x+2)(3x^2-2x-2)$

3. Evaluate polynomials
   Examples: For the function $f(x) = x^2 - 6x + 5$

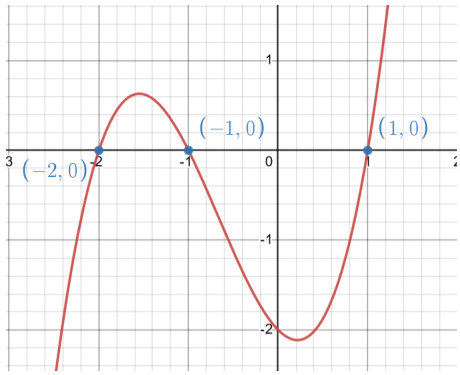
   (a) Find $f(1)$

   (b) Find $f(-2)$

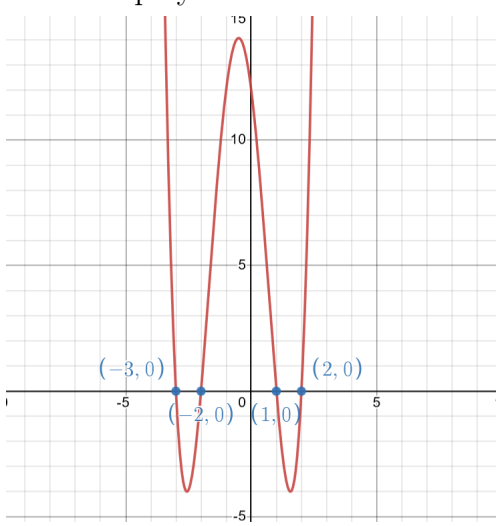
(c) Find $f(5)$

4. Graph of a polynomial
   Examples:

   (a) Find the polynomial that makes this graph.



   (b) Find the polynomial that makes this graph.



5. Add and subtract complex numbers
   Examples:

   (a) Compute $\sqrt{-12} + \sqrt{-27}$

(b) Compute $\sqrt{-8} + \sqrt{-32}$

(c) Compute $\sqrt{-3} - \sqrt{-27}$

(d) Compute $\sqrt{-8} - \sqrt{-2}$

6. Multiply and divide complex numbers
   Examples:

   (a) Compute $(3 + 2i)(4 - 3i)$

(b) Compute $(5-3i)^2$

(c) Compute $\frac{4+3i}{3-4i}$

(d) Compute $\frac{4}{1-4i}$

7. Factoring
   Examples:

   (a) Factor $x^2 + 10x + 24$

(b) Factor $x^2 - 4$

(c) Factor $10x^2 - 55x + 70$

(d) Factor $16x^2 - 32x + 12$

8. Solve quadratic equations
   Examples:

   (a) Solve $5x^2 = 80$

(b) Solve $x^2 + 4 = 0$

(c) Solve $2x^2 + 9x - 5 = 0$

(d) Solve $4x^2 - 2x = -8$