Quiz, Fall Week 4 Name: _____

Points possible: 100 Math 1050-90, Fall 2021, Due 9/21 at 11:59 p.m.

Rules/Suggestions: Write with a dark pencil, so that your work is visible. **You are graded on your work, not just answers. Even if you do calculations in your head or on scratch, show work if space is provided.** Write the final answer in the box.

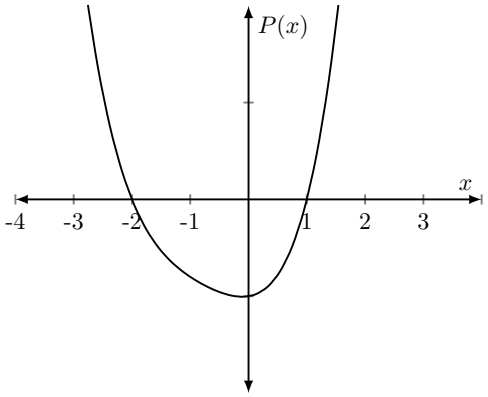
Notes: You are on your honor for this to be your own work. (You can ask for help on quiz material, but you should not ask for help on specific problems.)

1. Compute the following, given $A = 4 - 3i$ and $B = 2 + 5i$. Show clear work. Simplify to write answers in the form, $a + bi$.

   (1.1) (4 points) $B + A$ (1.2) (4 points) $-7A$ (1.3) (4 points) AB

$B + A =$ _____	$-7A =$ _____	$AB =$ _____

2. Find the requested information for the function $P(x) = x^4 + 3x^3 + 5x^2 + x - 10$. The graph of $P(x)$ is given below.



(2.1) (6 points) Find all the zeros of the function $P(x)$.

Zeroes:

(2.1) (6 points) Write the completely factored form of $P(x)$ into linear and irreducible quadratic factors.

Function:
$P(x) =$ _____

3. (12 points) Solve the polynomial inequality $2x^2 + 16 \geq x^2 + 8x + 4$. Write your answer in interval notation. Show work for how you determine the answer. (A sketch is highly recommended.)

Answer:

4. (12 points) Solve the polynomial inequality $(x - 8)(x + 6)(x - 4)^2 < 0$. Write your answer in interval notation Show work for how you determine the answer. (A sketch is highly recommended.)

Answer:

5. (20 points) The height h in feet of a model rocket above the ground t seconds after lift-off is given by $h(t) = -4t^2 + 72t$ for $0 \leq t \leq 20$. When is the rocket at least 288 feet off the ground. Show work for how you determine the answer. (A sketch is highly recommended.)

_____ seconds $\leq t \leq$ _____ seconds

6. Find the requested information for the function. Write asymptotes as equations and intercepts as ordered pairs.

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

(6.1) (8 points) Rewrite function with numerator and denominator factored:

$g(x) =$

(6.2) (4 points)

x-value of hole:
vertical asymptote(s):

(6.3) (4 points)

x-intercept(s):
y-intercept:

(6.4) (6 points)

other asymptote:
end behavior: As $x \to -\infty$, $f(x) \to$ _____ As $x \to \infty$, $f(x) \to$ _____
Range: :

(6.5) (10 points) Sketch the graph, carefully marking intercepts, asymptotes and holes.