

Name: _____

PID: _____

NOTE: You must show the steps necessary to arrive at your answer unless otherwise noted. Use your judgment, if you can't do the entire problem in your head, then you probably should write down at least some intermediate steps.

This assignment has 7 pages. There are 56 total points.

Problem 1 (8 points). Describe the long run behavior of the following functions:

(a) $f(x) = -x^5$

(b) $h(s) = s^{20}$

(c) $p(z) = -3z^4 + 4z^3 + z^2 - 5z + 5$

(d) $q(r) = r^5 + 3r^3 - 4r^6 + 2r$

Problem 2 (4 points). Are the following functions even, odd, or neither?

(a) $g(x) = x^5 - x^3 + 2$

(b) $h(a) = a^2 + 5a^6$

(c) $p(x) = x - x^3 - x^7$

(d) $q(x) = 5$

Problem 3 (4 points). Sketch the quadratic function $q(y) = 4 + \frac{1}{2}(y - 2)^2$. Label your axes.

Problem 4 (4 points). Sketch the quadratic function $w(x) = 2(x + 1)^2 + 1$. Label your axes.

Problem 5 (2 points). Determine the location of the vertex of $r(c) = -5(c + 3)^2 - 4$.

Problem 6 (2 points). Determine the location of the vertex of $w(y) = 3y^2 - 4y + 8$.

Problem 7 (12 points). Factor the following expressions.

(a) $z^2 - 10z + 25$

(b) $a^2 + a - 6$

(c) $a^2 - a - 6$

(d) $3b^2 + 3b - 6$

Problem 8 (6 points). Write the following quadratic functions in vertex form by completing the square.

(a) $f(x) = x^2 + 4x$

(b) $g(x) = x^2 - 6x + 10$

(c) $h(x) = 3x^2 + 12x + 11$

Problem 9 (4 points). Find all of the (real) roots of $g(x) = 3x^2 + 6x - 4$ using the quadratic formula. There may be 0, 1, or 2 answers.

Problem 10 (4 points). Find all of the (real) roots of $h(x) = 2x^2 - x + 5$. There may be 0, 1, or 2 answers.

Problem 11 (2 points). What is the vertical intercept of $b(z) = 5(z - 3)^2 - 10$?

Problem 12 (4 points). Sketch the functions $f(x) = -x^3$, $g(x) = -x^5$, and $h(x) = -x^7$ on the same coordinate plane. Mark the values 1 and -1 on both the vertical and horizontal axes.

[OPTIONAL]

Survey Questions.

1. Roughly how many hours did you spend working on this homework assignment?
2. When you study for this class, do you study... (*circle all that apply*)
alone **with a friend** **with a study group**