HOMEWORK #8 (20 pts)

SPRING 2013

SHOW ALL WORK FOR FULL CREDIT — CIRCLE YOUR FINAL ANSWER EXACT ANSWERS ONLY — WRITE ALL ANSWERS IN SIMPLEST FORM DUE: TUESDAY, APRIL 16, AT THE BEGINNING OF CLASS

1. (1 pt) Use the Rational Zero Theorem to list all possible rational zeros of

$$f(x) = 9x^5 - 6x^4 + 3x^3 - 7x + 8.$$

2. (1 pt) Find a polynomial function with zeros $x = \frac{7}{9}$ (multiplicity 3), x = 0 (multiplicity 2), and x = -3 (multiplicity 4). Please leave your answer in factored form.

3. Given below is the graph of f.



(a) (0.5 pt) Is the degree of f even or odd?

- (b) (0.5 pt) Is the leading coefficient of f positive or negative?
- (c) (0.5 pt) Determine the interval(s) where $f(x) \ge 0$.

(d) (0.5 pt) Determine the interval(s) where f(x) < 0.

(e) (1 pt) List the real zeros of f AND state whether each zero has even or odd multiplicity.

4. (2 pts) Solve: $6(3x - 8)^3 = 48$

5. (2 pts) Solve: $45x^3 + 24x^2 - 48x = 0$

6. (2 pts) Solve: $24x^3 - 28x^2 - 30x + 35 = 0$

7. (1 pt) Use synthetic division to divide

$$P(x) = 3x^5 - 4x^3 + 9x^2 + 2x - 5$$
 by $x + 2$.

Identify the quotient and remainder. Be specific.

8. (3 pts) Find all zeros of $f(x) = 18x^3 + 51x^2 + 6x - 18$. You must show all work.



9. Consider $P(x) = 4x^5 - 12x^4 - 87x^3 + 160x^2 + 168x - 288$ whose graph is given below.



(b) (4 pts) Find all other zeros of P. You must show all work. (Show algebraically that they are zeros).