Name:___________________________

SM3 2.4: Graphing Polynomials with Technology

Vocabulary: roots, positive, negative, relative minimum, relative maximum, extrema, increasing, decreasing

Notes: Because your calculator might not be identical to my calculator, plan on taking notes on regular paper today.

Problems: Find all the real roots of the given polynomials using a graphing utility, round to the nearest thousandth as necessary.

1) $y = x^3 + 4x^2 - 37x - 40$

2) $f(x) = -x^3 + 27x^2 - 239x + 693$

3) $p(x) = x^3 - 4x^2 - 28x - 32$

4) $y = 24x^3 + 4x^2 - 116x - 56$

5) $s(x) = -4x^3 + 5x^2 + 8x - 10$

6) $m(x) = -4x^3 + 44x^2 + 3x - 33$

7) $g(x) = x^3 - 4x^2 - 197x + 1230$

8) $y = x^3 - 5x^2 + 4x - 20$

9) $f(x) = -x^3 + 52x^2 - 105x + 250$

10) $y = x^4 - 6x^3 - 327x^2 - 1424x - 1104$

11) $h(x) = x^4 + 6x^3 + 29x^2 + 24x + 100$

12) $y = -x^4 - 18x^3 + 174x^2 - 18x + 175$

13) $q(x) = x^4 + 14x^3 - 62x^2 - 182x + 85$

14) $p(x) = x^4 - 2x^2 - 2x + 2$

For what interval(s) of the domain is the graph a) positive and b) negative.

15) $y = x^3 - 4x^2 - 11x + 30$

16) $f(x) = x^3 - 18x^2 + 96x - 160$

17) $g(x) = x^3 - 15x + 4$

18) $p(x) = x^3 + 6x^2 - 6x - 136$

19) $y = x^4 + 4x^3 - 226x^2 - 460x + 6825$

20) $q(x) = x^4 - 2x^3 + 14x^2 - 8x + 40$

For each polynomial, find all relative extrema.

21) $h(x) = x^3 - 3x^2$

22) $y = -x^3 + x^2 - 3$

23) $f(x) = 3x^3 - 42x^2 + 18x - 294$

24) $r(x) = -x^4 + 3x^2 - 3x$

25) $q(x) = 7x^3 - 21x^2 - 14$

26) $g(x) = x^4 - x^2 - x + 4$

27) $f(x) = -x^4 + 3x^2 + x - 4$

28) $s(x) = x^4 - x^2 - x + 3$

For what interval(s) of the domain is the graph a) increasing and b) decreasing?

29) $y = 2x^4 + 2x^3 - 6x^2 - 4$

30) $p(x) = x^3 - 12x^2 + 45x - 48$

31) $y = 5x^3 - 15x^2 + 20$

32) $t(x) = -8x^4 + 8x^2 + 24$

33) Mr. Wytiaz wants to build a sound proof box that he can climb into when he has a headache. But he wants the sum of the length, width, and height to equal 15 ft and the length must be twice the width. Wytiaz gets a little claustrophobic sometimes, so he also wants to maximize the interior volume. Find the dimensions of the box that result in the maximum volume.