Pre-AP Precalculus Name _____

Review for Test 2.2 – 2.5

Describe the right-hand and left-hand behavior of the graph of the polynomial function.

1) $f(x) = -x^2 + 6x + 9$

2) $g(x) = -x^5 – 7x^2 + 10x$

Find all real zeros of the polynomial function.

3) $f(x) = 2x^2 + 11x – 21$

4) $f(t) = t^3 – 3t$

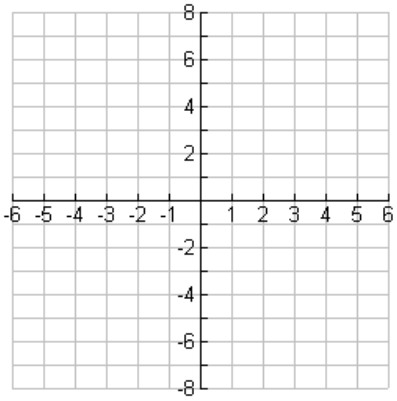
5) $f(x) = -12x^3 + 20x^2$

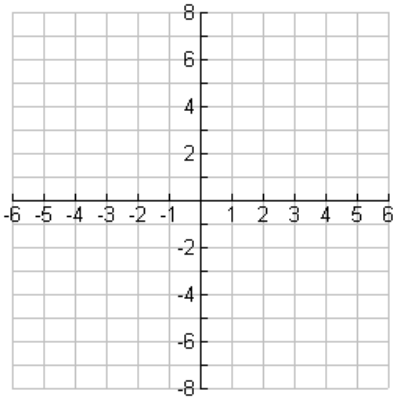
6) $g(x) = x^4 – x^3 – 2x^2$

Sketch the graph of the function by applying the Leading Coefficient Test, finding the zeros of the polynomial, plotting sufficient solution points, and drawing a continuous curve through the points.

7) $f(x) = 2x^3 + 4x^2$

8) $h(x) = 3x^2 – x^4$





Use long division to divide.

9) $\frac{24x^2 - x - 8}{3x - 2}$

10) $\frac{5x^3 - 13x^2 - x + 2}{x^2 - 3x + 1}$

Use synthetic division to divide.

11) $\frac{6x^4 - 4x^3 - 27x^2 + 18x}{x - 2}$

12) $\frac{2x^3 - 19x^2 + 38x + 24}{x - 4}$

Use synthetic division to determine whether the given values of x are zeros of the function.

13) $f(x) = 20x^4 + 9x^3 - 14x^2 - 3x$ a) $x = -1$ b) $x = 0$ c) $x = 1$ d) $x = \frac{3}{4}$

Verify the given factor(s) of the function f, find the remaining factors of f, then list all real zeros of f.

14) $f(x) = x^3 + 4x^2 - 25x - 28$
factor: $(x - 4)$

15) $f(x) = x^4 - 4x^3 - 7x^2 + 22x + 24$
factors: $(x + 2)(x - 3)$

Find all the zeros of the function.

16) $f(x) = 3x(x - 2)^2$

17) $f(x) = x^2 - 9x + 8$

18) $f(x) = x^3 + 6x$

19) $f(x) = (x + 4)(x - 6)(x - 2i)(x + 2i)$

Find <u>all</u> zeros of the function and write the polynomial as a product of linear factors.

20) $f(x) = x^3 + 4x^2 - 5x$

21) $g(x) = x^3 - 7x^2 + 36$

22) $g(x) = x^3+6x^2+5x-12$

23) $f(x) = x^4 +6x^3+8x^2-6x-9$

Perform the indicated operation. Write your answer in simplest form.

24) $(7 - 4i) + (-4 + 6i)$

25) $(3 + 6i)^2$

26) $\frac{3}{2+i} + \frac{7}{2-i}$

27) Simplify $\frac{5}{3i-5}$

28) Simplify $i^{15} + i^{34} - i^{41} - i^{84}$

29) Multiply $(\sqrt{7} + i\sqrt{34})$ by its conjugate

30) Find a polynomial function of degree 4 that has zeros at 4, -5, and 6i in both factored and standard form.