Math 1314 Review 3

1. For the two points $(-2,3)$ and $(3,-9)$, find the distance between them, and the midpoint of the segment that joins them.

2. Find an equation for the circle centered at $(-2,4)$ with a radius of $\sqrt{8}$.

3. Find the center and radius of the circle with equation $x^2+y^2-4x+2y-4=0$. Use the graph to determine the domain and range of the relation.

4. Find an equation for the circle which has $(3,6)$ and $(5,4)$ as endpoints of a diameter.

5. Graph the equations $\begin{matrix}(x-2)^2+(y+3)^2=4\\ y=x-3\end{matrix}$, and find their points of intersection.

Sketch the graphs of the following quadratic functions. Indicate the vertex, intercepts, and range of the function.

6. $f(x)=-(x+1)^2+4$ **7.** $f(x)=x^2-2x-3$ **8.** $f(x)=2x^2-4x-6$

Find the maximum or minimum value of the following quadratic functions.

9. $f(x)=-x^2+14x-106$ **10.** $f(x)=2x^2+12x+703$

Find a formula for the quadratic function whose graph satisfies the given conditions.

11. The vertex is $(-3,-4)$ and the graph passes through the point $(1,4)$.

12. The graph passes through the points $(1,4)$ and $(3,4)$ and the maximum value is 6.

13. The graph passes through the points $(0,4)$, $(1,3)$, and $(2,6)$.

Sketch the graph of the following polynomial functions. Label the zeros and y-intercept.

14. $f(x)=-\frac{1}{125}(x-1)(x+2)^2(x+5)^3$ **15.** $f(x)=x^3-x^2-9x+9$

16. $f(x)=4x-x^3$ **17.** $f(x)=3x^4-15x^3$

18. Use long division to find $(4x^4+6x^3+3x-1)\div(2x^2+1)$.

19. Use synthetic division to find $(3x^4+11x^3-20x^2+7x+35)\div(x+5)$

20. Given $f(x)=-2x^3+7x^2-9x+3$, use the remainder theorem to find $f(3)$.

21. Solve the equation $x^3-17x+4=0$, given that 4 is a solution.

Use The Rational Zero Theorem to list all the possible rational zeros of the following polynomials.

22. $f(x)=x^4-6x^3+14x^2-14x+5$ **23.** $f(x)=3x^5-2x^4-15x^3+10x^2+12x-8$

Use Descarte's Rule of Signs to determine the possible number of positive and negative zeros of the following polynomials.

24. $f(x)=3x^4-2x^3-8x+5$ **25.** $f(x)=2x^5-3x^3-5x^2+3x-1$

Find all the zeros of the following polynomials.

26. $f(x)=x^3+3x^2-4$ **27.** $f(x)=2x^3+9x^2-7x+1$ **28.** $f(x)=4x^4+7x^2-2$

Find an n^{th} degree polynomial function with real coefficients that satisfies the given conditions.

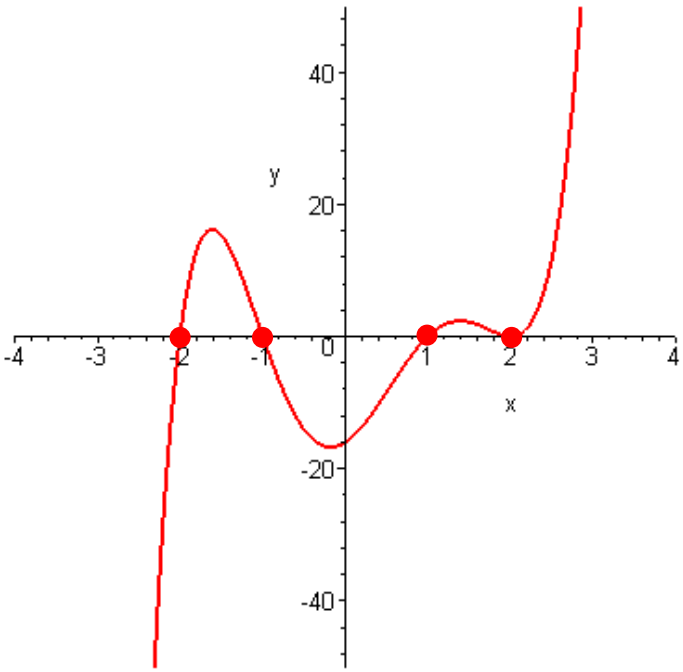
29. $n=3$, 2 and $2-3i$ are zeros; $f(1)=-10$

30. $n=4$, i is a zero and -3 is a zero of multiplicity 2; $f(-1)=16$

31. Find all the zeros of $f(x)=2x^4+3x^3+3x-2$ and write the polynomial as a product of linear factors.

Graphs of fifth-degree polynomials are given. Tell the number of real zeros and the number of imaginary zeros.

32.



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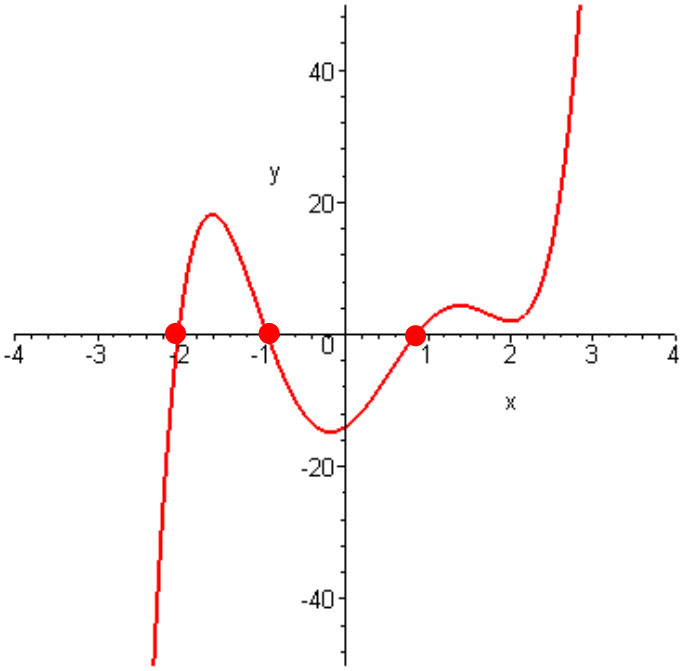

34. How many real zeros does the polynomial $f(x)=2x^5+x+8$ have?

35. Find the value of *k* so that $x-3$ is a factor of $x^5-3x^4+6x^2-k$.

36. What is the remainder when $x^{999}+500x^{998}+x^3+500x^2+x+499$ is divided by $x+500$?

37. Is $x-1$ a factor of $x^{567}-3x^{400}+x^9+2$?