Algebra/Trig Review for Calculus

1. Suppose $f(t) = -16t^2 + 20t + 100$ gives the height in feet of an object *t* seconds after being tossed upward. Find the following quantities:
   a. the initial height
   b. the time it takes for the object to hit the ground
   c. the time it takes for the object to reach its maximum height
   d. the maximum height

Find all solutions to the following equations. Also identify the corresponding function and state the domain. Give exact answers when possible and round approximate answer to 2 decimal places.

2. $2(x-1)(x+2)+(x-1)^2=0$

3. $2(x+4)(x-3)+(x+4)^2=0$

4. $6x^2+6x-12=0$

5. $9x^3-7x^2-2x=0$

6. $3(x-3)^2=0$

7. $6(2x+5)^2=0$

8. $4x^3-6x^2=0$

9. $5x^4+3x^3=0$

10. $4x^3-32=0$

11. $\frac{2}{3}(x-1)^{-1/3}=0$

12. $\frac{1}{4}(x+3)^{-3/4}=0$

13. $x^{1/3}+1=0$

14. $x^{1/4}-16=0$

15. $\frac{2}{3}x^{-1/3}(x-5)+x^{2/3}=0$

16. $\frac{1}{2}x^{-1/2}(x+2)+x^{1/2}=0$

17. $1-\frac{1}{x^2}=0$

18. $2x-\frac{1}{x^2}=0$

19. $2.44-\frac{2x}{20{,}000}=0$

20. $\frac{(x+1)-x}{(x+1)^2}=0$

21. $\frac{2(x-3)-2x}{(x-3)^2}=0$

22. $\frac{2x(x^2-9)-x^2(2x)}{(x^2-9)}=0$

23. $\frac{x^2-2x(x+3)}{(x^2)^2}=0$

24. $\frac{(2x-2)(x+1)-(x^2-2x+1)}{(x+1)^2}=0$

25. $\frac{(2x-3)(x-2)-(x^2-3x-4)}{(x-2)^2}=0$

26. $e^x+xe^x=0$

27. $2xe^{x^2}=0$

28. $2xe^x+x^2e^x=0$

29. $e^{-x}-xe^{-x}+3e^{3x}=0$

30. $\left(e^{4\sqrt{x}+x^2}\right)\left(\frac{2}{\sqrt{x}}+2x\right)=0$

31. $\frac{1-\ln t}{t^2}=0$

32. $\frac{\frac{1}{x}(1+\ln x)-(\ln x)\left(\frac{1}{x}\right)}{(1+\ln x)^2}=0$

33. $(\ln t)^2+2t(\ln t)\frac{1}{t}=0$

34. $\frac{1}{2}-\sin x=0$

35. $\frac{1}{2}+\cos x=0$

36. $-\sin^2\theta+\cos^2\theta=0$

37. $2\sin\varphi\cos\varphi+\cos\varphi=0$

38. $-23\sin\left[\frac{2\pi(t-32)}{365}\right](2\pi)=0$

39. $\frac{-\sin\gamma(1+\sin^2\gamma)-\cos\gamma(2\sin\gamma\cos\gamma)}{(1+\sin^2\gamma)^2}=0$