

Final Exam Review (Additional Questions)

34. Solve the following equations and if there are extraneous solutions, please state so.

a. $3x^2 - 8x + 5 = 0$

b. $3x^{2/3} - 8x^{1/3} + 5 = 0$

35. Solve the following system of equations and inequalities.

a.
$$\begin{cases} y = 3x^2 - 4 \\ x^2 + y^2 = 9 \end{cases}$$

b.
$$\begin{cases} y < 3x^2 - 4 \\ x^2 + y^2 \geq 9 \end{cases}$$

36. A ball is thrown into the air with an initial velocity of 25 m/s. The ball's height h (in meters) after t seconds is given by the following.

$$h = 4 + 25t - 4.9t^2$$

- Find all the values of t for which the ball's height is 20 feet. Round your answers to the nearest hundredth. If there is more than one answer, use or to separate them.
- What is the maximum height reached by the ball? At what time will the ball reach the ground?
- When will the ball hit the ground?

For the questions below decide on the best answer possible.

37. In a quadratic function of the type $f(x) = ax^2 + bx + c$

- What is the significance of the vertex when applied to a real life situation?
- What is the significance of the x -intercept?
- What is the significance of the y -intercept?
- How do the solutions to the quadratic equation $ax^2 + bx + c = 0$ relate to the graph of the function $f(x) = ax^2 + bx + c$?
- What controls the focus of a parabola?
- What controls the direction of a parabola (up or down)?
- How is the equation $y = ax^2 + bx + c$ related to the function $f(x) = ax^2 + bx + c$?
- What is the difference between the equation $y = ax^2 + bx + c$ or $x = ay^2 + by + c$?
- What is the significance of the solutions to $ax^2 + bx + c < 0$ and the graph of the function $f(x) = ax^2 + bx + c$?

38. When you use rational zeros theorem to find the zeros of a polynomial equation $P(x) = 0$, how does that relate back to the polynomial function $P(x)$?

39. What is the connection between a logarithmic function and an exponential function with base a ?

40. What is difference in the equation of an ellipse verses a hyperbola? Give a couple examples?

41. What is a difference between an ellipse and a hyperbola?