



7. When air is pumped into an automobile tire, the pressure is inversely proportional to the volume. If the pressure is 35 pounds when the volume is 120 cubic inches, what is the pressure, in pounds, when the volume is 140 cubic inches?

9. In the equation  $ax^2 + bx + c = 0$ ,  $a$ ,  $b$ , and  $c$  are real numbers. If  $\frac{1}{3} - \frac{2}{3}i$  is a root of this equation, what is the sum of the roots?

8. Simplify:

$$\frac{\frac{x^2}{y} - y}{\frac{x}{y} + 1}$$

10. What is the length of the minor axis in the ellipse  $4x^2 + (y - 7)^2 = 64$  ?

11. At the local video rental store, José rents two movies and three games for a total of \$15.50. At the same time, Meg rents three movies and one game for a total of \$12.05. How much money is needed to rent a combination of one game and one movie?

12. Olive Math is standing on the 102<sup>nd</sup> floor of the Empire State Building, thinking about mathematics. She realizes that, if she were able to throw a ball from her present position, the height of the ball in feet,  $h$ , at time  $t$  seconds could be modeled by the equation

$$h(t) = -16t^2 + 64t + 1,224$$

- a) How high above the ground is the 102<sup>nd</sup> floor?
- b) What is the greatest height the ball would reach?
- c) How long would it take to reach that height?
- d) How long would it take the ball to hit the ground?

