



## MATH 1201 Unit 3 Discussion Post (10)

College Algebra (University of the People)

Polynomial and rational functions can be used to model a wide variety of phenomena of science, technology, and everyday life.

Choose one of these sectors and give an example of a polynomial or rational function modeling a situation in that sector. [Hint: see the examples and exercises in the book.]

Go to [www.desmos.com/calculator](http://www.desmos.com/calculator), write your equation, or function, and develop your explanation using the properties of graphs.

Rational functions can be applied to many real-life applications. Take for instance, the Potency of a drug and its pain-relieving effects on the body at (t) hours are expressed by the function  $P(t)=4t/3t^2+3$ . This is a rational function, as it is a ratio of two polynomial functions (4t) and  $(3t^2+3)$ . (4t) is a polynomial because it can be expressed as  $(4t+0)$ .

$$P(t) = \frac{4t}{3t^2+3}$$

For 1 hour  $P(t) = \frac{4(1)}{3(1)^2+3} \Rightarrow \frac{4}{3+3=6} = \frac{4}{6}$  or 66% potency.

For 2 hours  $P(t) = \frac{4(2)}{3(2)^2+3} \Rightarrow \frac{8}{12+3+15} = \frac{8}{15}$  or 53% potency.

For 4 hours  $P(t) = \frac{4(4)}{3(4)^2+3} \Rightarrow \frac{16}{48+3=51} = \frac{16}{51}$  or 31% potency.

This pain reliever gives you the most pain fighting strength by the first hour with a 66 percent potency. After hour 2, the potency drops to 53 percent. The drugs power gradually decreases by hour 8, tapering down to about 15 percent. Pain medications commonly ware off after 4 to 6 hours. All drugs are evaluated in this fashion to rate their strength and potential harm to the person taking them. It is crucial to the health of the public to accurately assess all drugs potency and recommended dosages.

## Reference

Abramson, J. (2017). Algebra and trigonometry. OpenStax, TX: Rice University. Retrieved from <https://openstax.org/details/books/algebra-and-trigonometry>

