

Problem 1:

This part of the homework is for you to not only practice your skill at building functions, but to also compose them (using functions on functions). Also, there's a start of a teaser for understanding stocks. Look at the set of equations below—they provide the information to complete this section.

$$\text{speed} = \frac{\text{distance}}{\text{time}} \quad (10)$$

$$1 \text{ mile} = 5280 \text{ feet} \quad (11)$$

$$1 \text{ mile} = 1.60934 \text{ kilometers} \quad (12)$$

$$1 \text{ degree} = \frac{\pi}{180} \text{ radians} \quad (13)$$

$$c^2 = a^2 + b^2 - 2ab \cos(\gamma) \quad (14)$$

$$^{\circ}\text{F} = \left(\frac{9}{5}\right)^{\circ}\text{C} + 32 \quad (15)$$

$$^{\circ}\text{C} = \text{K} - 273 \quad (16)$$

$$\text{Light Speed} = 299792 \text{ kilometers/second} \quad (17)$$

$$1 \text{ parsec} = 3.086 \times 10^{13} \text{ kilometers} \quad (18)$$

$$1 \text{ parsec} = 3.26 \text{ light years} \quad (19)$$

$$pc(s, d) = \begin{cases} -(1 - \frac{s+d}{s}) & s < 0 \\ \frac{s+d}{s} - 1 & \text{otherwise} \end{cases} \quad (20)$$

s stock price, d dollar value lost or gained.

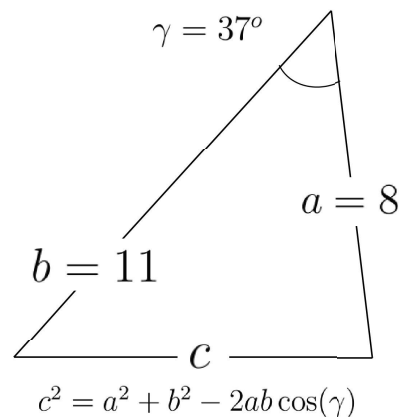


Figure 1: Illustration of the Law of Cosines. We can find the length of c using the lengths of sides a, b and the opposite facing angle γ . We have to convert the angle into radians from degrees to use the \cos function.