

Math 1332: Worksheet 1

August 25, 2021

Name: _____

1. You are painting foam spheres for an art project. The spheres come in two sizes: small spheres with a diameter of 2 inches, and large spheres with a diameter of 4 inches. You already bought a single tube of white paint, for the small spheres, and a single tube of orange paint, for the large spheres. You start painting the small spheres, but run out of paint before finishing; the one tube of paint was enough to paint 12 small spheres. Seeing that you need to go back to the art store, you decide to calculate how much more you need to buy, so you don't need to make any more extra trips.
 - (a) If you have 30 small spheres in total to paint, how many more tubes of white paint do you need to buy?
 - (b) If you have 5 large spheres to paint, do you need to buy more tubes of orange paint? If so, how many more?
[Hint: You are painting a uniform thickness so the amount of paint you need is proportional to the area you are painting. The formula for the surface area of a sphere is $4\pi r^2$, where r is the radius.]
 - (c) If the white paint costs \$3.50 per tube and the orange paint costs \$4.20 per tube, how much in total will you need to spend on paint? (Include the two tubes you already bought.)

2. You are buying a car, and are trying to decide between two options. The first car costs \$6000 and gets 25 miles per gallon. The second car costs \$8000 and gets 35 miles per gallon. In other respects the two cars are very similar, and the primary factor in your decision is overall cost for the vehicle plus gas expenses.
- (a) You estimate that you drive an average of 300 miles per month, and that gas costs \$2.75 per gallon. Write expressions which express how much each option would cost you, in terms of the variable M for number of months since you bought the car.
 - (b) Is the total cost proportional to the number of months you own the car? Explain why or why not.
 - (c) If you expect to own the car for 3 years, which option is best?
 - (d) Is the assumption about the primary factor in deciding which car to buy a reasonable one? Explain why you do or do not think so.