MATH 1030: Homework 11

due December 5, 2012

Instructions: Do the following problems on a separate sheet of paper. Show all of your work.

Problem 1

Simplify the following expression: $\dfrac{a^5 b^{-4}}{(a^{-3}b^2)^2} \cdot (ab^{-3})^3$

Problem 2

Solve for t in the following: $\dfrac{7-t}{7} = \dfrac{2t}{3}$.

Problem 3

Suppose that you are planning a trip to Brazil. At a Brazilian grocery store, the price of milk is 2.35 reais per lieter. What is the price in US dollars per gallon?
(1 dollar = 1.73 reais, 1 gallon = 3.785 liters)

Problem 4

78% of the people surveyed said that they have an internet connection in their home, and out of those, 85% said that they also have a cell phone. Of the people surveyed, what percentage of them have both an internet connection and a cell phone?

Problem 5

Suppose that $\$2,500$ is deposited in a bank account having 1.35% annual interest, compounded yearly. What will the balance of the account be twenty years from now assuming no further withdrawals or deposits are made?

Problem 6

Graph the line $3x - 5y = -15$. Find the slope of the line, and the x and y intercepts.

Problem 7

There is a cylindrical tank whose height is 20 feet, surface area is $785.4\,\text{ft}^2$ and volume is $1,570.8\,\text{ft}^3$. A scaled-down model of this tank will be made with height 2 ft. Find the surface area and the volume of the scaled-down model.

Problem 8

Convert the following angles to degrees, minutes, and seconds

(a) 27.1828°

(b) 16.1803°

Convert the following angles into decimal degrees

(c) 27.1828°

(d) 16.1803°

Problem 9

You see your friend off in the distance. He is 6 feet tall. To the naked eye, his angular size (i.e., the angle he subtends) is 0.3437°.

(a) How far away is he?

Being an avid birdwatcher, you quickly whip out your binoculars. Looking through the binoculars, your friends' angular size is 0.12 radians.

(b) How far away does he appear to be in the binoculars?

(c) What is the magnification power of the binoculars?