Solutions

ENGR290: Renewable Energy

Quiz 1: Prerequisites

May 13, 2014

Notes:

Don't worry, this quiz won't count for much. It is just to get an idea of where you are in your math and engineering skills so that you will know what you need to work on.

Problem 1: Road Trip

1. If you are travelling from Albuquerque to Farmington at an average speed of $60\frac{miles}{hour}$ and it is 180 miles, how long will it take to get there?

$$\frac{1\,hr}{60\,miles} \quad 180\,miles \quad = 3\,hr$$

2. If you are in a hurry, how fast do you need to drive to get there in 2 hours?

$$\frac{180\,miles}{2\,hrs} = 90 \ \frac{miles}{hr}$$

Problem 2: Water Heater

1. Water has a specific heat of $4.0\frac{J}{g°C}$ and a density of $1000\frac{kg}{m^3}$. A kiloWatt is $1000\frac{J}{s}$ and $1m^3 = 1000l$. If I have a water tank that holds $1000l$ of water, how much power do I need to apply to it to heat it from $20°C$ to $60°C$? *(IN ONE HOUR)*

$$60 - 20 = 40°C$$

$$\frac{4.0\,J}{g°C} \quad \frac{1000g}{kg} \quad \frac{1000kg}{m^3} \quad \frac{1m^3}{1000l} \quad 1000l \quad \frac{1\,hr}{3600sec} \quad = 44 \quad kW$$