

# Chapter O - Problems

Blinn College - Physics 2425 - Terry Honan

## Problem O.1

What is the change in entropy of 3 kg of water initially at 20 °C when it is cooled and frozen resulting in ice at 0°C?

## Problem O.2

What is the total change in entropy when 3000 J of heat flows into a house at 20 °C from the warm exterior at 40 °C?

## Problem O.3

What is the total change in entropy when a 20 g ice cube at 0 °C is dropped into the Gulf of Mexico, which is at a temperature 15 °C? It is *quite* safe to assume that the temperature change of the Gulf is negligible.

## Problem O.4

A heat engine absorbs 6000 J of heat from a hot reservoir and expels 4100 J to a cold reservoir at 30 °C.

- (a) What is the efficiency of this engine?
- (b) What is the work done by the engine?
- (c) What is the smallest temperature the hot reservoir could have?

## Problem O.5

A Carnot engine that operates between a 500 K hot reservoir and a 300 K cold reservoir has a power output of 6000 W. What is the efficiency of this heat engine? At what rate does this engine absorb heat?