WORKSHEET: **Problem Solving Strategy in Related Rates**
MATH 110, Wednesday, Jan 10

Answer the questions following each scenario.

1. You walk alongside a calm lake and you throw a rock into the lake. Since the lake is calm, ripples in the shape of concentric circles are formed on the water.

   (a) Draw a diagram of this scenario and determine what quantities are changing over time.

   (b) Assign variables to the quantities that are changing (found in part a).

   (c) Set up an equation relating area and radius of each ripple.

   $\rightarrow$ If the radius of a ripple is increasing at a rate of 3 inches per second. Find the rate of increase in the area of the ripple when the radius is 6 inches.

2. Two cars start their trip from the same house. Car A is traveling east and car B is going north.

   (a) Draw a diagram of this scenario and assign variables to the distances that are changing.

   (b) Set up an equation relating the assigned variables.

$\rightarrow$ If car A is traveling at a speed of $30\,km/h$ and car B is traveling at a speed of $45\,km/h$, at what rate is the distance between the two cars increasing when car A is $6\,km$ and car B is $8\,km$ away from the house.

3. A person 6 feet tall walks away from a streetlamp 18 feet above ground level. The light at the top of the lamp casts a shadow in front of the person.

   (a) Draw a diagram of this situation. Assign variables to the distance of the person from the lamp and distance of the "tip" of his/her shadow from the lamp.

   (b) Set up an equation that relates the variables in part (a).

$\rightarrow$ If this person walks away from the lamp at a rate of $5\,ft/s$. How fast is the "tip" of the shadow moving along the ground?