Name: _____   Date: _____

Learning Goal 3.7	Creating confidence in word problems.

Play Day – Answers

1. It is found that a certain manufacturer produces q thousand units per week when the unit price is $\$p$. Suppose the relationship between q and p is $q^2 - 3pq + p^2 = 5$. What is the rate of change of the supply when the quantity produced is 4 000 units and the unit price is $\$11$, increasing at a rate of $\$0.10$ per week?

$$40 \text{ units per week}$$

2. You are inflating a spherical balloon at the rate of 7 $cm^3/_s$. How fast is the radius increasing when the radius is 4 cm?

$$\frac{7}{64\pi} \ cm/_s$$

3. Water is poured into a conical container at the rate of 10 $cm^3/_s$. The cone points directly down, and it has a height of 30 cm and a base radius of 10 cm. How fast is the water level rising when the water is 4 cm deep at its deepest point?

$$\frac{90}{16\pi} \ cm/_s$$

4. A swing consists of a board a the end of a 10 ft long rope. Think of the board as a point P at the end fo the rope, and let Q be the point of attachment at the other end. Suppose that the swing is directly below Q at time $t = 0$, and is being pushed by someone who walks at 6 $ft/_s$ from left to right.
   a. How fast is the swing rising after 1 s?

$$4.5 \ ft/_s$$

   b. What is the angular speed of the rope in $rad/_s$ after 1 s?

$$\frac{3}{4} \ rad/_s$$

5. A road running north to south crosses a road going east to west at the point P. Car A is driving north along the first road and car B is driving east along the second road. At a particular time car A is 10 km to the north of P and travelling at 80 $km/_{hr}$, while car B is 15 km to the east of P and traveling at 100 $km/_{hr}$. How fast is the distance between the two cars changing?

$$\frac{460}{\sqrt{13}} \ km/_{hr}$$