Regular Homework #5

Do the following problems from the textbook: Pp. 147-148: Q 39, 40, 42, 44, 46, 54.
Also, do the following three limit problems.

1. Show that
$$\lim_{x \to a} \cos(x) \;=\; \cos(a)$$
using a similar method to the way we showed that $\lim_{x \to a} \sin(x) = \sin(a)$ in class.

2. By using the method that we developed in class for computing the limit of the difference quotient of the $\sin(x)$ function at the input a, show that
$$\lim_{h \to 0} \frac{\cos(a+h) - \cos(a)}{h} \;=\; -\sin(a)$$

3. Evaluate the limit
$$\lim_{x \to 0} \frac{1 - \cos(x)}{x^2}$$
Hint: Think about how we evaluated the limit of the difference quotient of the cos function at 0 in class.