Solve each of the following by factoring:

1)
$$x^2 - 144 = 0$$

2)
$$x^2 = -3x$$

$$3) \ 3y^2 + 12y = 0$$

4)
$$x^2 + x = 30$$

$$5) x^2 = -19x + 84$$

6)
$$x^2 + 4x = 12$$