Honeybees have remarkable visual learning and discrimination abilities that extend beyond learning simple colours, shapes or patterns. They can discriminate landscape scenes, types of flowers, and even human faces. This suggests that in spite of their small brain, honeybees have a highly developed capacity for processing complex visual information, comparable in many respects to vertebrates. Here, we investigated whether this capacity extends to complex images that humans distinguish on the basis of artistic style: Impressionist paintings by Monet and Cubist paintings by Picasso. We show that honeybees learned to simultaneously discriminate between five different Monet and Picasso paintings, and that they do not rely on luminance, colour, or spatial frequency information for discrimination. When presented with novel paintings of the same style, the bees even demonstrated some ability to generalize. This suggests that honeybees are able to discriminate Monet paintings from Picasso ones by extracting and learning the characteristic visual information inherent in each painting style. We propose that like birds and humans, honeybees may use the underlying structural regularities that are consistent across all paintings by the same artist as the visual cue for discrimination and categorization. The cognitive capacity of honeybees to learn and categorize even visually highly complex images may underlie their amazing ability to navigate cluttered landscapes and develop robust navigational maps of their foraging environment.