Landsat - Exploring Washington D.C.

Problem 1 - This Landsat-7 image of Washington D.C. was taken on May 9, 2005. Using a metric ruler, and the conversion 1 kilometer = 0.62 miles, what is the scale of the image in meters per millimeter, and how large is the field in kilometers?

Problem 2 - Use a map of the area (e.g.GOOGLE maps) to find the following features and determine their width: A) Potomac River; B) Arlington Memorial Bridge; C) National Mall; D) Highway 395; E) RFK Stadium; F) A large Boulevard.

Problem 3 - Comparing the park lands (dark areas), the rivers and the man-made developments (light areas); about what would you estimate as the percentage of this metropolitan area that is developed?

Space Math   http://spacemath.gsfc.nasa.gov

Problem 1 - This Landsat-7 image of Washington D.C. was taken on May 9, 2005. Using a metric ruler, and the conversion 1 kilometer = 0.62 miles, what is the scale of the image in meters per millimeter, and how large is the field in kilometers?
Answer: The legend in the lower right indicates that 1 mile = 14 millimeters. This means 1.61 kilometers = 14 millimeters or that the scale is 115 meters/mm. The field measures 156mm x 156mm or **17.9 km on a side**.

Problem 2 - Use a map of the area (e.g.GOOGLE maps) to find the following features and determine their width (See labels in below image):
A) Potomac River; About 9 millimeters wide before split with Anacostia River between two arrows, or 9mm x 115 m/mm = 1.0 kilometers.
B) Arlington Memorial Bridge; The second bridge to the north that crosses the Potomac River. Width is about 0.5 mm x 115 m/mm = 58 meters.
C) National Mall; About 1 mm or 155 meters.
D) Highway 395; White roadway, about 1 mm wide or 115 meters.
E) RFK Stadium; Round building, about 2mm in diameter or 230 meters.
F) A large Boulevard. Black streak about 0.3mm wide or 34 meters.

Problem 3 - Comparing the park lands (dark areas), the rivers and the man-made developments (light areas); about what percentage of this metropolitan area is developed?

Answer: The full area is 17.9 km x 17.9 km = 320 km^2. The developed areas are the ones in grey which represent concrete and asphalt surfaces or buildings. The areas that include the park lands and river can be cut out and fitted together into a square, or can be determined more accurately by dividing the full area into 10x10 squares and adding up the number of squares that mostly cover the dark areas. **Students estimates will vary depending on the method used for estimating the irregular areas, but should amount to about 25% of the full area. The fraction of the full area that is developed in this particular view is about 3/4 or 75%.**