

Quiz 3. February 10, 2012. Name

1) Describe in specific terms and illustrate with a diagram how a semicircular arch with 5 identical voussoirs can be constructed with straightedge and compass.

2) Given that each voussoir weighs 250 pounds, estimate the horizontal force with which the keystone of the semicircular arch referred to in (1) pushes outward in each direction. (In your answer you may select from the formulas below.)

Formulas: $H_0 = \frac{W}{2} \cdot \frac{1}{\tan \frac{\alpha}{2}}$, $H_1 = W \cdot \frac{1}{\tan \frac{3\alpha}{2}}$, $H_2 = W \cdot \frac{1}{\tan \frac{5\alpha}{2}}$, $P_0 = \frac{W}{2} \cdot \frac{1}{\sin \frac{\alpha}{2}}$, $P_1 = W \cdot \frac{1}{\sin \frac{3\alpha}{2}}$, $P_2 = W \cdot \frac{1}{\sin \frac{5\alpha}{2}}$.

3) Describe the important structural features of the Pantheon, especially its dome. (Note: A structural feature is one that is relevant to the *structural stability* of the building.)