

2004Q3

(a) 4 sampled out of 20 represents 20%, which is a large enough percentage that we cannot assume that the probability of a selected bone being from a male is constant from bone to bone, since we are sampling without replacement.

(b) M M M M  
$$\left(\frac{10}{20}\right)\left(\frac{9}{19}\right)\left(\frac{8}{18}\right)\left(\frac{7}{17}\right) = \boxed{.10433}$$

(c) No, because there is only a 4.3% chance of all 4 bones being male randomly (less than the usual  $\alpha = .05$ ).

(d) one of the conditions for inference for 1 sample proportion is that the sample is an SRS from the population or that we believe the sample is representative of the population. Because this sample came from a single location which trapped some dinosaurs it is not reasonable to assume that 20 skeletons would be representative of all dinosaur skeletons.