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**Worksheet Sep. 6 – Calculus 1, Fall 2016**

1. For the following functions, identify the domain of each and state where each is continuous. Also, explain why each function is discontinuous at each point of discontinuity.

(a)  $f(t) = \cos(3t + 4)$

(b)  $h(s) = \tan(s - 1)$

(c)  $g(x) = \sin\left(\frac{x-1}{x^2-1}\right)$

2. (a) Use IVT to show that the equation  $x^3 - 5x^2 + 1 = 0$  has three different real roots. Find intervals containing these roots.

(b) Use the method of bisection to approximate one of the roots of the equation  $x^3 - 5x^2 + 1 = 0$  to within 0.25.

**3.** For  $f(x) = \frac{2x+1}{4x^2-1}$ ,

(a) find all points of discontinuity

(b) use limits to work out the behavior of function near the points of discontinuity

(c) use limits to find the horizontal asymptotes

(d) Sketch graph based on parts a-c.