Present neatly on separate paper. Justify for full credit. No Calculators.

Name _____ Score _____ ~15 minutes

1. In each case draw a graph of f(x) on the interval [0, 4]. [4 points]

a)

Jump discontinuity at $x = 2$ and does not satisfy the conclusion of the IVT.

b)

Jump discontinuity at $x = 2$ and satisfies the conclusion of the IVT on $[0, 4]$.

c)

Infinite one-sided limits at $x = 2$ and does not satisfy the conclusion of the IVT.

d)

Infinite one-sided limits at $x = 2$ and satisfies the conclusion of the IVT on $[0, 4]$.

2.

For a) through d), find the limit or explain why it does not exist. [6 points]

a)

$$\lim_{h\to 0} \frac{\sin(2h)(1-\cos h)}{h^2}$$

b)

$$\lim_{x\to \frac{\pi}{3}} \frac{2\cos^2 x + 3\cos x - 2}{2\cos x - 1}$$

c)

$$\lim_{x\to -2} \frac{x^3+8}{x^2+6x+8}$$

d)

$$\lim_{\theta\to \frac{\pi}{4}} \left(\frac{1}{\tan\theta - 1} - \frac{2}{\tan^2\theta - 1}\right)$$

e) Find the value(s) of c for which the limit exists.

$$\lim_{x\to 1} \frac{x^2+3x+c}{x-1}$$

f) Find the value(s) of c for which the limit exists.

$$\lim_{x\to 1} \left(\frac{1}{x-1} - \frac{c}{x^3-1}\right)$$