Name: Richard

MATH 200 – QUIZ 10 ☞
March 26, 2015

1. Consider the function $f(x) = x^2 - 4x + 7$.

(a) Find all critical points of $f(x)$.

$$f'(x) = 2x - 4 = 0$$
$$x - 2 = 0$$
$$x = 2$$

$f'(x)$ is defined for all x. $f'(x)=0$ only for $x=2$. Therefore $\boxed{x=2 \text{ is critical point}}$

(b) Find the absolute extrema of $f(x)$ on the closed interval $[0, 3]$.

$f(0) = 0^2 - 4\cdot 0 + 7 = 7$ ← largest
$f(2) = 2^2 - 4\cdot 2 + 7 = 3$ ← smallest
$f(3) = 3^2 - 4\cdot 3 + 7 = 4$

Absolute max: $f(0) = 7$
Absolute min: $f(2) = 3$

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1. Consider the function $f(x) = x^3 - 3x$.

(a) Find all critical points of $f(x)$.

$$f'(x) = 3x^2 - 3 = 0$$
$$x^2 - 1 = 0$$
$$(x-1)(x+1) = 0$$

→ $f'(x)=0$ for $x=-1$ and $x=1$

Critical points are 1 and −1

(b) Find the absolute extrema of $f(x)$ on the closed interval $[0, 2]$.

Only the critical point $x=1$ is in the interval.

$f(0) = 0^3 - 3\cdot 0 = 0$
$f(1) = 1^3 - 3\cdot 1 = -2$ ← smallest
$f(2) = 2^3 - 3\cdot 2 = 2$ ← largest

Absolute max: $f(2) = 2$
Absolute min: $f(1) = -2$