

Section 2.5: Continuity

Problem 1. Show that there is a solution of the equation $\ln(x) = 3 - 2x$ between 1 and 2.

Section 2.6: Limits at Infinity; Horizontal Asymptotes

Problem 2. Find the horizontal asymptotes of the following functions:

(a) $f(x) = \frac{9x^3 + 8x - 4}{(x-2)^3}$ (b) $g(x) = \frac{\sqrt{1+4x^6}}{2-x^3}$.

Section 2.7: Derivatives and Rates of Change

Problem 3. The height (in meters) of a rock t seconds after it has been thrown upward on the planet Mars is given by

$$H(t) = 10t - 1.86t^2.$$

- (a) Find the velocity of the rock after one second.
- (b) Find the velocity of the rock when $t = a$.
- (c) When will the rock hit the surface?
- (d) With what velocity will the rock hit the surface?