## Suggested Homework for Lecture 10

## Math 116

(1) Using the given information and value of $x_{1}$, find $x_{2}$ using Newton's method.
(1a) $x_{1}=2, f(2)=6, f^{\prime}(2)=2$
(1b) $x_{1}=5, f(5)=10, f^{\prime}(5)=-10$
(1c) $x_{1}=0, f(0)=f^{\prime}(0)=3$
(2) An equation $f(x)$ and initial guess $x_{1}$ are given. Using Newton's method, find $x_{2}$.
(2a) $f(x)=x^{3}-2, x_{1}=1$
(2b) $f(x)=x^{4}-x^{2}-1, x_{1}=2$
(2c) $f(x)=x^{5}-3, x_{1}=2$
(3) An equation $f(x)$ and initial guess $x_{1}$ are given. Using Newton's method, find $x_{2}$ and $x_{3}$.
(3a) $f(x)=x^{2}-x-1, x_{1}=1$
(3b) $f(x)=e^{x}-2, x_{1}=0$
(3c) $f(x)=\ln (x)-1, x_{1}=1$

## Answers to Suggested Homework for Lecture 10

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(1a) $x_{2}=-1$
(1b) $x_{2}=6$
(1c) $x_{2}=-1$
(2a) $x_{2}=\frac{4}{3}$
(2b) $x_{2}=\frac{53}{28}$
(2c) $x_{2}=\frac{131}{80}$
(3a) $x_{2}=2, x_{3}=\frac{5}{3}$
(3b) $x_{2}=1, x_{3}=\frac{2}{e}$
(3c) $x_{2}=2, x_{3}=4-2 \ln (2)$

