Lesson 3.3.3

3-111. See below:

d. Zeros on f' represent the maxima and minima of f.

e. Zeros on f'' represent points of inflection on f and maxima and minima of f'.

3-112. See below:

a. There are two zeros.

b. Some students will look at slope---positive slope means local min, negative slope means local max (this is the 2nd derivative test). Others will look at how f' is changing: negative to positive means local max, positive to negative means local min. For the graph shown the max is x = A and the min is x = B.

c. Kat is correct, if the zero does not represent a change in sign, then it is not a point of inflection. Also, a max or min on $f'(x)$ represents a point of inflection on f.

3-113. $y'' = 6x + 3$, so at $x = 0$, $y'' = 3$. Since $y'' > 0$, then y is concave up.

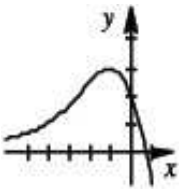
3-114. One possible solution:

3-116. See below:

a. ≈ 2.417

b. ≈ 3.347

3-117. See sample graph below.



3-118. E

3-119. See below:

a. They will both compute the derivative of $f(x) = (x + 1)(x + 2)$. Part (*i*) uses Hana's method to find $f'(x)$ while part (ii) uses Hanah's method.

b. $f'(x) = 2x + 3$

3-120. 11; These are both definitions of the derivative of $f(x) = (x + 1)(x + 2)$ from the previous problems. Part (a) uses Hana's method to find $f'(4)$ and part (b) uses Ana's method to find $f'(4)$.

3-121. ≈ 339 mph; ≈ 0.0942 miles

3-122. $x = -1, 6$

3-123. See below:

a. $\frac{1}{5}$

b. $-\frac{1}{4}$

c. $\frac{12}{13}$

d. DNE but $y = -\infty$