Created by Rukiyah Walker

Question 1 **(1 pts)**

What is Newton's Method used for?

A. Finding the derivative of a polynomial of degree 5 or higher.

B. To show that a derivative exists.

C. To show that $\lim_{n\to\infty} x_n$ exists.

D. Finding an approximation of the root(s) of a function.

Question 2 **(1 pts)**

When might Newton's Method fail?

A. When $f'(x)$ is close to 0.

B. When $f(x) = f'(x)$.

C. When $\lim_{x\to\infty} f(x) = 0$.

D. When $x_{n+1} = x_n$.

Question 3 **(1 pts)**

How can you still use Newton's Method after it fails?

A. Set $f(x) = 0$.

B. Use a different method.

C. Choose a better initial approximation, x_1.

D. Set $x_{n+1} = x_n$.

Question 4 **(1 pts)**

Newton's Method says the next approximation is given by $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$, where x_n is the nth approximation and $f'(x_n) \neq 0$. If the numbers x_n become closer and closer to some number r as n becomes large, we say that the sequence converges to r. What does this mean in terms of limits?

A. $\lim_{x\to\infty} n = r$

B. $\lim_{n\to\infty} x_n = r$

C. $\lim_{x\to\infty} x = r$

D. $\lim_{r\to\infty} x_n = \infty$

Question 5 **(1 pts)**

A function F is called an antiderivative of f on an interval I if $F'(x) = f(x)$ for all x in I. What does this mean?

A. F is a function whose derivative is equal to the original function f.

B. $\lim_{x\to\infty} F'(x) = f(x)$

C. There exists only one antiderivative for $f(x)$.

D. $\lim_{x\to\infty} f(x) = F'(x)$

Question 6 **(1 pts)**

What is the general antiderivative of $f(x) = x^n$?

A. $F(x) = \frac{x^{n+1}}{n+1}$

B. $F(x) = \frac{(n+1)x}{n+1} + C$

C. $F(x) = \frac{x^{n+1}}{n+1} + C$

D. $F(x) = \frac{(n+1)x}{n+1}$

Question 7 **(1 pts)**

Which of the following is NOT an example of an antiderivative of the function $f(x) = x^2 + x$?

A. $F(x) = \frac{x^3}{3} + \frac{x^2}{2} + C$

B. $F(x) = \frac{x^3}{3} + \frac{x^2}{2} + 2$

C. $F(x) = \frac{x^3}{3} + \frac{x^2}{2} + 100$

D. $F(x) = \frac{x^3}{3} + \frac{x^2}{2} + 2x$

Question 8 **(1 pts)**

Find the antiderivative of $f(x) = x^2 + 2x$ given $F(0) = 1$.

A. $F(x) = \frac{x^3}{3} + x^2$

B. $F(x) = \frac{x^3}{3} + x^2 + 1.$

C. $F(x) = \frac{x^3}{3} + \frac{x}{2}$

D. $F(x) = 1$

Question 9 **(1 pts)**

Find the antiderivative of $f(x) = \frac{2x^3+\sqrt{x}}{x}$ given $F(1) = 2$.

A. $F(x) = \frac{2}{3}x^3 + 2x^{1/2} - \frac{8}{3}$

B. $F(x) = \frac{8}{3}$

C. $F(x) = \frac{x^3}{3} + 2x^{1/2}$

D. $F(x) = \frac{2}{3}x^3 + 2x^{1/2}$

Question 10 **(1 pts)**

How can we approximate the area of the region S which lies under the curve $y = x^2$?

A. Take the derivative of $y = x^2$.

B. Use the height of the function (h) and length of the interval (l), then $A = hl$.

C. Divide the interval into a bunch of subintervals (rectangles) of equal length then take the sum of the areas of the rectangles.

D. Use newton's method.