EMCF 17

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1. Use one iteration of Newton's method from a guess of $x = 1$ to approximate a solution to $x^4 + \frac{3}{4}x - 2 = 0$. What is the result?
   a. 1.05221
   b. 1.05278
   c. 1.05376
   d. 1.05477
   e. 1.05263
   f. None of these.
2. Use one iteration of Newton's method from a guess of $x = 1$ to approximate a solution to $x^4 + x - \frac{9}{10} = 0$. What is the result?
   a. .75
   b. .76
   c. .77
   d. .78
   e. .79
   f. None of these.
3. Use differentials to approximate $\sqrt{36.1}$ from a guess of 6. What is the result?
   a. 6.0855
   b. 6.0833
   c. 6.0844
   d. 6.0811
   e. 6.0822
   f. None of these.
4. Give the differential of $f(x) = x^2 + 2x - 1$ at $x = 1$ with increment .01.
   a. 1/20
   b. 1/10
   c. 1/100
   d. 1/25
   e. 1/15
   f. None of these.
5. Give a value of c that verifies the mean value theorem for $f(x) = -2x^2 + 3x - 1$ on the interval [1,3].
   a. 5/2
   b. 2
   c. 3/2
   d. 9/4

e. 7/4
f. None of these.

6. Give the number of values of c that verify the mean value theorem for $f(x)=\sin(x)$ on the interval [-1,5]. Hint: Look at the graph.
   a. 1
   b. 2
   c. 3
   d. 4
   e. 5
   f. None of these.
7. Give the number of values of c that verify the mean value theorem for $f(x)=3\cos(2x)+x$ on the interval [-1,5]. Hint: Look at the graph.
   a. 1
   b. 2
   c. 3
   d. 4
   e. 5
   f. None of these.
8. Give the smallest value of x where the derivative of $f(x)=x^3-3x-1$ is zero.
   a. -1
   b. 0
   c. 1
   d. -2
   e. 2
   f. None of these.
9. Use differentials to approximate a value for $f(1.9)$ given that $f(2)$ = -1 and $f'(x)=\sqrt{x^3+1}$.
   a. -1.1
   b. -1.15
   c. -1.2
   d. -1.25
   e. -1.3
   f. None of these.
10. Use Newton's method to approximate $\sqrt{26}$. **Hint:** You know $\sqrt{26}$ is a solution to $x^2-26=0$, and 5 is a reasonable first guess.
    a. 5.05
    b. 5.1
    c. 5.15
    d. 5.2
    e. 5.25
    f. None of these.