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MATH-101 Term-131 IN-Class-QUIZ-17

(show all your work and circle one letter to get a full mark or you will get zero)

80/80

1) Newton's method is used to estimate the x-coordinate of the point of intersection of the curves $y = \sqrt{x}$ and $y = 1 - x^2$. If we start with $x_0 = 1$, then $x_1 =$

(a) $\frac{1}{2}$

(b) 0

(c) $\frac{-1}{2}$

(d) $\frac{3}{5}$

(e) $\frac{8}{5}$

$y_1 = 1 - x^2$

$y_2 = \sqrt{x}$

$\sqrt{x} = 1 - x$

$x^2 + \sqrt{x} - 1 =$

$f(x) = x^2 + \sqrt{x} - 1$ $f(1) = 1$

$f'(1) = 2 + \frac{1}{2} = \frac{5}{2}$

$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)}$

$= 1 - \frac{1}{5/2}$

$= 1 - \frac{2}{5}$

$= 3/5 = 0.6$

2) If $g'(x) = \frac{xe^{2x} + \sqrt[3]{x}}{x}$ and $g(0) = \frac{1}{2}(1 - e^2)$ then $g(1) =$

(a) 0

(b) 1

(c) 2

(d) 3

(e) 4

$g'(x) = e^{2x} + x^{-2/3}$

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

$g(0) = \frac{1}{2} + C = \frac{1}{2} - \frac{1}{2}$

$C = -\frac{1}{2}e$

$g(1) = \frac{1}{2}e^2 + 3\sqrt[3]{1} - \frac{1}{2}e^2$

$= 3\sqrt[3]{1} = 3$

2) If $g'(x) = \frac{2+x^2}{1+x^2}$ and $g(0) = -\frac{\pi}{4}$ then $g(1) =$

(a) 0

(b) 1

(c) -1

(d) 2

(e) -2

$g'(x) = 1 + \frac{1}{x^2+1}$

$g(x) = x + \tan^{-1}(x) + C$

$g(0) = 0 + 0 + C = -\frac{\pi}{4}$

$g(1) = 1 + \frac{\pi}{4} - \frac{\pi}{4} = 1$