Calculus Web Assignments

Web Assignments are intended to be completed with a partner. Both partners should individually work each of the problems, followed by a collaborative discussion about the problem.

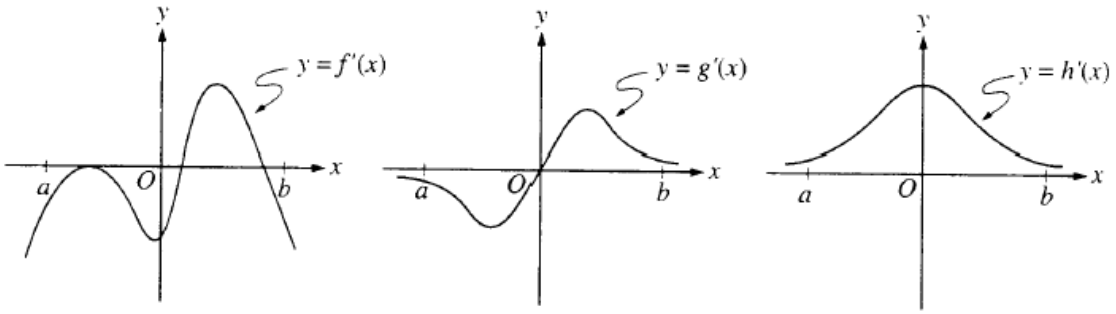
Both partners are required to participate in the "Honor-System" Grading of the Web Assignment.

Calculus: Web Assignment #14

Multiple Choice

Identify the choice that best completes the statement or answers the question.

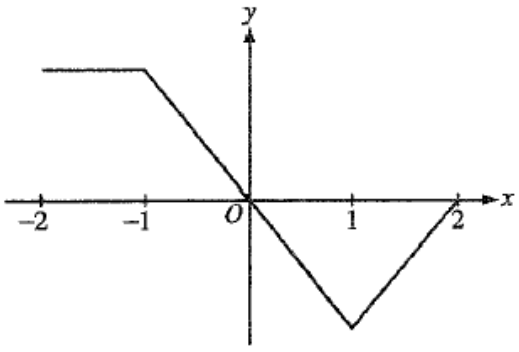
____ 1.



The graphs of the derivatives of the functions $f,\ g,\ and\ h$ are shown above. Which of the functions $f,\ g,\ or\ h$ have a relative maximum on the open interval $a < x < b$?

a. f only
b. g only
c. h only
d. f and g only
e. $f,\ g,\ and\ h$

____ 2.



Graph of f'

The graph of f', the derivative of the function f, is shown above. Which of the following statements is true about f?

a. f is decreasing for $-1 \le x \le 1$.
b. f is increasing for $-2 \le x \le 0$.
c. f is increasing for $1 \le x \le 2$.
d. f has a local minimum at $x = 0$.
e. f is not differentiable at $x = -1$ and $x = 1$.

____ 3. The slope of the normal line to $y = \sin x + 2\cos x$ *at* $\left(\frac{\pi}{2}, 1\right)$ *is*

a. -2
b. 1
c. $\frac{1}{2}$
d. $-\frac{1}{2}$
e. None of the above

____ 4. *If* $y = xe^x$, *then* $\dfrac{d^2y}{dx^2} =$

a. xe^x

b. $(x+1)e^x$

c. $(x+2)e^x$

d. $(x+3)e^x$

e. $xe^x + 3$

____ 5. Which of the following gives the derivative of the function $f(x) = x^2$.

a. $\lim_{h \to 0} \dfrac{(x+2)^2 - x^2}{h}$

b. $\lim_{h \to 0} \dfrac{(x+h)^2 - x^2}{h}$

c. $\lim_{h \to 0} \dfrac{(x+h)^2 + x^2}{h}$

d. $\dfrac{(x+h)^2 - x^2}{h}$

e. $\lim_{h \to 0} \dfrac{(x-h)^2 + x^2}{h}$

____ 6. $\int 9xe^{3x^2+1}\,dx =$

a. $\dfrac{3}{2}x^2e^{x^3+x} + C$

b. $\dfrac{9}{2}x^2e^{x^3+x} + C$

c. $\dfrac{9}{2}x^2e^{3x^3+1} + C$

d. $e^{3x^2+1} + C$

e. $\dfrac{3}{2}e^{3x^2+1} + C$

____ 7. What is $\int \frac{x-3}{x}\,dx$?

a. $1-3\ln x+c$
b. $x-3\ln x+c$
c. $1+\frac{3}{x^2}+c$
d. $\frac{x^2-3x}{x^2}+c$
e. $\frac{x^2}{2}-3\ln x+c$

____ 8. Solve the differential equation $\frac{dy}{dx}=3x^2+\sin x+2$ *if* $y=2$ *when* $x=0$.

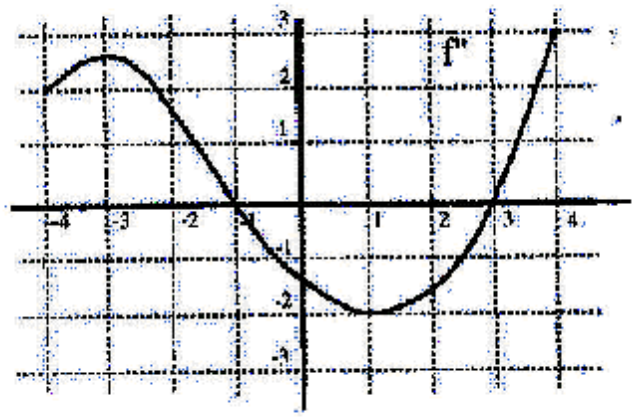
a. $y=x^3-\cos x+2x+3$
b. $y=x^3-\cos x+2x+2$
c. $y=x^3+\cos x+2x+1$
d. $y=x^3-\cos x+2x+C$
e. $y=x^3+\cos x+2x$

____ 9. Consider the function $f(x)=\frac{(x-a)(x-b)}{(x-c)^2}$. The equations of the asymptotes are

a. $x=a,\ x=b,\ x=c$
b. $x=a,\ x=b$
c. $x=a,\ y=ab$
d. $x=c,\ y=1$
e. $x=c$ *only*

____ 10. The graph of the second derivative of a function f is shown below. Which of the following is true?

I. The graph of f has an inflection point at x = -1.
II. The graph of f is concave down on the interval (-1, 3).
III. The graph of the derivative function f' is increasing at x = 1.



a. I only
b. II only
c. III only
d. I and II only
e. I, II, and III