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 #22

Multiple Choice

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

____ 1. Find the indefinite integral $\int 2\sec y\left(\tan y - \sec y\right)dy$.

a. $2\sec y\tan y + C$
b. $2\sec y - 2\tan y + C$
c. $2\sec y + \tan y + C$
d. $2 + 2\sec y + C$
e. $2\sec y\tan y - 2\sec y + C$

____ 2. Solve the differential equation.

$$\frac{dP}{dx} = 15x^4 - 5, \quad P(-2) = 8$$

a. $P(x) = 3x^5 + 5x$
b. $P(x) = 3x^5 + 94$
c. $P(x) = 3x^5 - 5x + 94$
d. $P(x) = 60x^3 - 5x + 94$
e. $P(x) = 3x^5 + C$

____ 3. Use left endpoints and 10 rectangles to find the approximation of the area of the region between the graph of the function $4x^2 - x - 1$ and the x-axis over the interval $[4,14]$. Round your answer to the nearest integer.

a. 2925
b. 3325
c. 3000
d. 3250
e. 3125

____ 4. Write the limit $\lim_{|\Delta x| \to 0} \sum_{i=1}^{n} 4c_i\left(7 - c_i\right)^2 \Delta x_i$, as a definite integral on the interval $[0,8]$ where c_i is any point in the i^{th} subinterval.

a. $\int_0^8 4x(7-x)^8 dx$

b. $\int_8^0 4x^2(7-x)^8 dx$

c. $\int_8^{c_i} 4c_i\left(7 - c_i\right)^2 \Delta x_i$

d. $\int_0^8 4x(7-x)^2 dx$

e. $\int_0^{c_i} 4c_i\left(7 - c_i\right)^2 \Delta x_i$

____ 5. $\frac{d}{dx}\int_{2}^{x}\sqrt{1+t^2}\,dt =$

a. $\frac{x}{\sqrt{1+x^2}}$

b. $\sqrt{1+x^2}-5$

c. $\sqrt{1+x^2}$

d. $\frac{x}{\sqrt{1+x^2}}-\frac{1}{\sqrt{5}}$

e. $\frac{1}{2\sqrt{1+x^2}}-\frac{1}{2\sqrt{5}}$

____ 6. What are the values of *x* for which the function *f* defined by $f(x)=\left(x^2-3\right)e^{-x}$ is decreasing?

a. There are no such value of *x*.

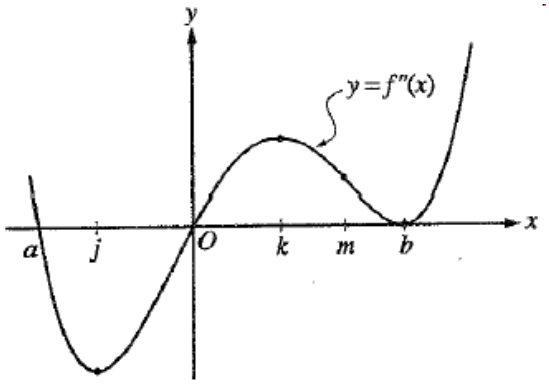
b. $x<-1 \text{ and } x>3$

c. $-3<x<1$

d. $-1<x<3$

e. All values of *x*

____ 7.



The second derivative of the function *f* is given by $f''(x) = x(x-a)(x-b)^2$. The graph of f'' is shown above. For what values of *x* does the graph of *f* have a point of inflection?

a. 0 and *a* only
b. 0 and *m* only
c. *b* and *j* only
d. 0, *a*, and *b*
e. *b*, *j*, and *k*

____ 8. The $\lim_{x \to 0} \frac{\tan 3(x+h) - \tan 3x}{h}$ is

a. 0
b. $3\sec^2(3x)$
c. $\sec^2(3x)$
d. $3\cos(3x)$
e. nonexistent

____ 9. Let R represent the region enclosed by the graphs y = x and y = x^2 over the interval [0, 1]. What is the volume of the solid that results when R is revolved about the line y = 2?

a. $\pi\int_0^1 \left[\left(2-x^2\right)^2-(2-x)^2\right]dx$

b. $\pi\int_0^1 \left[(2-x)^2-\left(2-x^2\right)^2\right]dx$

c. $\pi\int_0^1 \left[\left(\sqrt{y}\right)^2-(y)^2\right]dy$

d. $\pi\int_0^1 \left[(y)^2-\left(\sqrt{y}\right)^2\right]dy$

e. $\pi\int_0^2 \left[\left(2-y\right)^2-\left(2-\sqrt{y}\right)^2\right]dy$

____ 10. A point moves on the x-axis in such a way that its velocity at time t (t > 0) is given by $v = \frac{\ln t}{t}$. At what value of t does v attain its maximum?

a. 1

b. $e^{\frac{1}{2}}$

c. e

d. $e^{\frac{3}{2}}$

e. There is no maximum value of v.