

Here are the choices for your answers:

A. -12

K. 4

R. $\frac{15x^2 + 4x}{2\sqrt{3x+1}}$

A. -10

L. $\frac{40}{9}$

S. $\frac{-9x^2 + 4x}{2\sqrt{3x+1}}$

A. $\frac{-4}{9}$

M. $\frac{5}{\sqrt{3}}$

S. $8\sec^4 4x$

B. $\frac{-11}{4}$

M. 6

T. $8\tan 4x \sec^2 4x$

C. $\frac{4}{9}$

N. 9

T. $y - \frac{1}{2} = x - \frac{\pi}{4}$

D. $\frac{1}{4}$

N. 13

T. $-6 < x < 2$

D. $\frac{6}{5}$

N. 27

U. $y - \frac{1}{2} = \frac{1}{2}\left(x - \frac{\pi}{4}\right)$

E. $e-1$

N. 128π

V. $x > 2$

E. $\frac{11}{6}$

N. $\frac{12\sqrt{3}-12}{\pi}$

V. $-3\cot 3x$

F. $e+1$

O. $\frac{12-4\sqrt{3}}{\pi}$

W. $-3\tan 3x$

G. 2

O. (5, 15)

Y. None of the above

H. $\frac{128\pi}{3}$

P. (5, -48)

I. 3.5

Q. $\frac{\sin 2x}{2}$

I. $\frac{32}{9}$

R. $\frac{\sin 2x - 1}{2}$

A calculator may NOT be used on these questions.

R 1. $\int_{\frac{\pi}{4}}^x \cos 2t \, dt =$

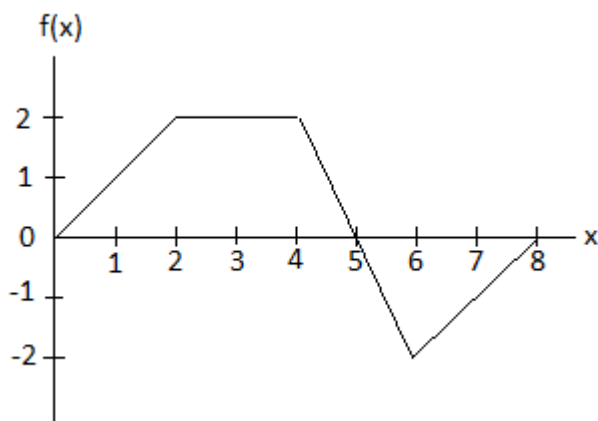
O 2. Determine the coordinates of the point of inflection on the graph of $y = x^3 - 15x^2 + 33x + 100$.

A 3. If $3x^2 - 2xy + 3y = 1$, then when $x = 2$, $\frac{dy}{dx} =$

I 4. $\int_1^3 \frac{8}{x^3} \, dx =$

K 5. The graph of a piecewise linear function f , for $0 \leq x \leq 8$, is shown below.

What is the value of $\int_0^8 f(x) \, dx$?



R 6. If $f(x) = x^2\sqrt{3x+1}$, then $f'(x) =$

A 7. What is the instantaneous rate of change at $t = -1$ of the function f ,

if $f(t) = \frac{t^3 + t}{4t + 1}$?

N 8. $\int_2^{e+1} \left(\frac{13}{x-1} \right) dx =$

I 9. $\frac{d}{dx}(\tan^2 4x) =$

I 10. Determine the equation of the line tangent to the graph of

$y = \sin^2 x$ at $\frac{\pi}{4}$?

D 11. If the function $f(x) = \begin{cases} 3ax^2 + 2bx + 1; & x \leq 1 \\ ax^4 - 4bx^2 - 3x; & x > 1 \end{cases}$ is differentiable for all real values of x , then $b =$

I 12. On what interval is the graph of $y = x^4 + 8x^3 - 72x^2 + 4$ concave down?

E 13. If $f(x) = \frac{x^2 + 5x - 24}{x^2 + 10x + 16}$, then $\lim_{x \rightarrow -8} f(x) =$

W 14. If $f(x) = \ln(\cos(3x))$, then $f'(x) =$

G 15. If $f(x) = \int_0^{x+1} \sqrt[3]{t^2 - 1} dt$, then $f'(-4) =$

I 16. A particle moves along the x-axis so that its position at time t , in seconds, is given by $x(t) = t^2 - 7t + 6$. For what value(s) of t is the velocity of the particle zero?

E 17. $\int_0^{\frac{\pi}{2}} \sin(2x) e^{\sin^2 x} dx =$

O 18. The average value of $\sec^2 x$ on the interval $\left[\frac{\pi}{6}, \frac{\pi}{4}\right]$ is

N 19. Determine the area of the region bounded by the parabolas $y = x^2$ and $y = 6x - x^2$.

D 20. $\lim_{x \rightarrow 0} \frac{\tan(3x) + 3x}{\sin(5x)} =$

N 21. If the region enclosed by the y-axis, the curve $y = 4\sqrt{x}$, and the line $y = 8$ is revolved about the x-axis, determine the volume of the solid generated.

M 22. Determine the value of c that satisfies the Mean Value Theorem for derivatives on the interval $[0, 5]$ for the function $f(x) = x^3 - 6x$.