Evaluate the given integral.

$$\int_{-65}^{65} x e^{-9x^2}\,dx = \int_{u=-585\ldots}^{-585\ldots} e^u\,du \Big/ -18 = 0$$

-585...

x =

Your Answer:

definite integral means use calculator

fnint(xe^(-9x^2),x,-65,65) = 0

$u = -9x^2$

$du = -18x\,dx$

$du/-18 = x\,dx$

$u(65) = -585$

$u(-65) = -585$

Evaluate $\int \frac{2\sin x}{\sqrt{\cos x}}\,dx.$ $(-du)$

$u = \cos x$

$du = -\sin x\,dx$

$-du = \sin x\,dx$

$$\int \frac{-2}{\sqrt{u}}\,du$$

$$-2\int u^{-1/2}\,du$$

$$-2\,\frac{u^{1/2}}{1/2} + C$$

$$-4(\cos x)^{1/2} + C$$

Make the indicated substitution for an unspecified function $f(x)$.

$u = \sin x$ for $\int_0^{\pi/2} 2(\cos x) f(\sin x)\, dx$

$\underbrace{f(\sin x)}_{f(u)}$

du=cosx dx

A. $\int_0^1 f(u)\, du$

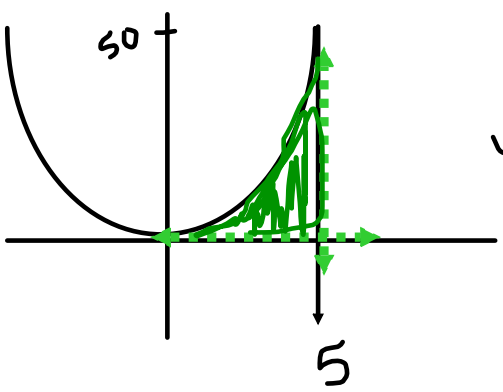
B. $\int_0^1 2f(u)\, du$

C. $\int_0^{1/2} f(u)\, du$

D. $\int_0^{1/2} 2f(u)\, du$

$\int_{u=\sin(0)=0}^{\sin(pi/2)=1} 2f(u)du$

Find the area of the region bounded by $y = 2x^2$, $x = 5$, and the x-axis. Express your answer as a decimal rounded to three places, if necessary.



$$\int_0^5 2x^2\, dx =$$

$$\frac{2x^3}{3}\Big|_0^5$$

$$\frac{2}{3}5^3 - \frac{2}{3}0^3 = \frac{250}{3}$$

Evaluate $\int_2^3 x^2\sqrt{x^3+9}\,dx =$

u = x^3+9

du= 3x^2 dx

du/3 = x^2 dx

A. $\left(\frac{2}{3}\right)[36^{3/2} - 17^{3/2}]$

B. $\left(\frac{1}{3}\right)\left(\frac{2}{3}\right)[36^{3/2} - 17^{3/2}]$

C. $\left(\frac{1}{3}\right)[36^{3/2} - 17^{3/2}]$

D. $\left(\frac{1}{3}\right)\left(\frac{2}{3}\right)[17^{3/2} - 36^{3/2}]$

$$\int_{17}^{36} \sqrt{u}\,du/3$$

$$\frac{1}{3}\int_{17}^{36} u^{1/2}\,du$$

$$\left(\frac{1}{3}\right)\frac{u^{3/2}}{3/2}\Big|_{17}^{36}$$

$$= \left(\frac{1}{3}\right)\left(\frac{2}{3}\right)\left(36^{3/2} - (17)^{3/2}\right)$$

B. $\left(\frac{1}{3}\right)\left(\frac{2}{3}\right)[36^{3/2} - 17^{3/2}]$ ✓

Evaluate $\int (5\cos x + 5x^5)\,dx$. Use c as the constant.

$$+5\sin x + \frac{5x^6}{6} + C$$

Find the position function $s(t)$ given the acceleration function and an initial value.
$a(t) = 10 - t$, $v(0) = 4$, $s(0) = 0$

$s(t) =$

$a = v' = s''$

$v = \int a \, dt$

$= \int 10 - t \, dt$

$v(t) = 10t - \frac{t^2}{2} + C$

$v(0) = 4 = 10(0) - (0)^2 + C$

$v(t) = 10t - t^2/2 + 4$

$s(t) = \int v(t) \, dt$

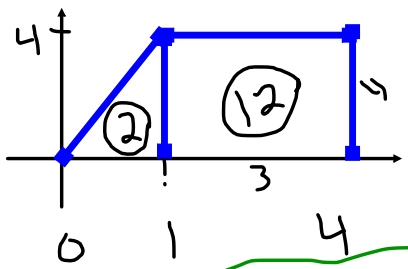
$s = \int 10t - t^2/2 + 4 \, dt$

$s = 10t^2/2 - t^3/6 + 4t + C$

$s(0) = 0 - 0 + 0 + C = 0 \quad c = 0$

$s = 10t^2/2 - t^3/6 + 4t$

Compute the area of $\int_0^4 f(x) \, dx$ for $f(x) = 4x$ if $x < 1$, and $f(x) = 4$ if $x \geq 1$.



Ans:
12+2=14

$\int_0^1 4x \, dx + \int_1^4 4 \, dx$

$\frac{4x^2}{2}\Big|_0^1 + 4x\Big|_1^4$

$2 + 4(4 - 1) = 2 + 12 = 14$

Use summation rules to compute the sum.

$$\sum_{i=1}^{71} (3i - 1) = \boxed{}$$

$$\sum^{71} 3i - \sum^{71} 1$$

$$3\sum^{71} i - 71 \cdot 1$$

$$3 \cdot \frac{71 \cdot 72}{2} - 71 = 7597$$

sum(seq(3X-1,X,1,71,1))=

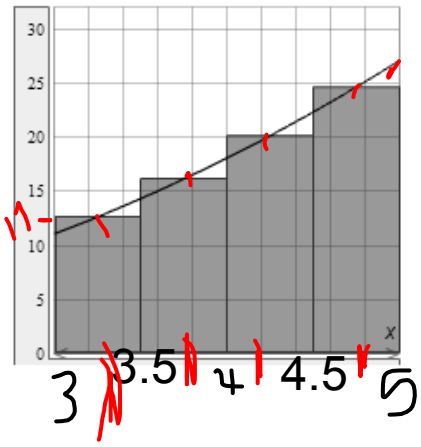
List the evaluation points corresponding to the midpoint of each subinterval to three decimal places, sketch the function and approximating rectangles and evaluate the Riemann sum to six decimal places if needed.

$f(x) = x^2 + 2, \quad [3, 5], \; n = 4.$

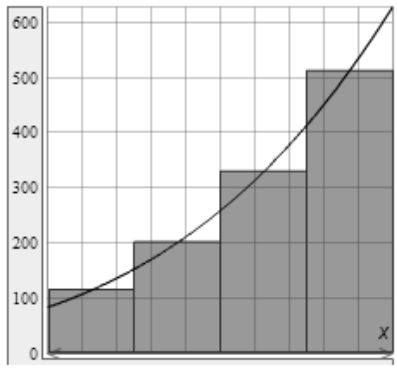
Give your answer in an ascending order.

Evaluation points: 3.25, 3.75, 4.25, and 4.75.

A.



B.



sum(seq(x^2+2,x,3.25,4.75,.5))*.5=36.625

Use Part I of the Fundamental Theorem to compute the integral exactly.

$\int_0^8 x(x-4)\,dx$

$$\int_0^8 x^2 - 4x \, dx$$

$$\frac{x^3}{3} - \frac{4x^2}{2} \Big|_0^8 = \frac{8^3}{3} - \frac{4 \cdot 8^2}{2}$$

Compute $\int_1^{25} \left(\sqrt{x} - \frac{1}{x^2}\right) dx$.

$$\int_1^{25} x^{1/2} - x^{-2} \, dx$$

$$\frac{x^{3/2}}{3/2} + \frac{1}{x} \Big|_1^{25}$$

fnint(x^.5-x^-2,x,1,25)=155.04

Compute the average value of the function $f(x) = x^2 - 4$ on the interval [0,6].

$$\int_0^6 x^2 - 4 \, dx = \frac{x^3}{3} - 4x \Big|_0^6$$

72-24 = 48

average value = 48 / (6 - 0) = 8

For $f(x) = \int_{10}^{x} (t^2 - 7t + 8)\, dt$, compute $f'(x)$.

$$\frac{t^3}{3} - \frac{7t^2}{2} + 8t \Big|_{10}^{x}$$

$$f(x) = \frac{x^3}{3} - \frac{7x^2}{2} + 8x - \left(\frac{1000}{3} - \frac{700}{2} + 80\right)$$

0

$x^2 - 7x + 8$

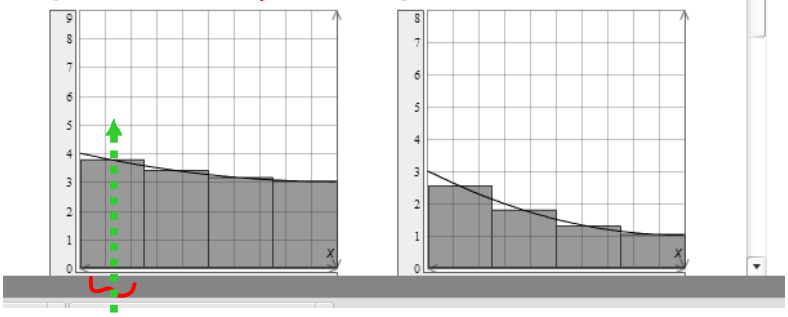
List the evaluation points corresponding to the midpoint of each subinterval to three decimal places, sketch the function and approximating rectangles and evaluate the Riemann sum to six decimal places if needed.

$f(x) = x^2 + 3, \quad [-1, 0], \; n = 4.$

Give your answer in an ascending order.

Evaluation points: [ ], [ ], [ ] and [ ].

A. B.



A

−.875
.25
−.625
.25
−.375
.25
−.125

0

−1

−.875

$-1 + \frac{1}{2}(.25)$

dx = (0 - -1) / 4= .25

sum (seq(x*x+3,x,-.875,0,.25))*.25
=3.328333

$$\int \frac{\ln x}{x}\,dx$$

$u = \ln x$

$du = \frac{1}{x}\,dx$