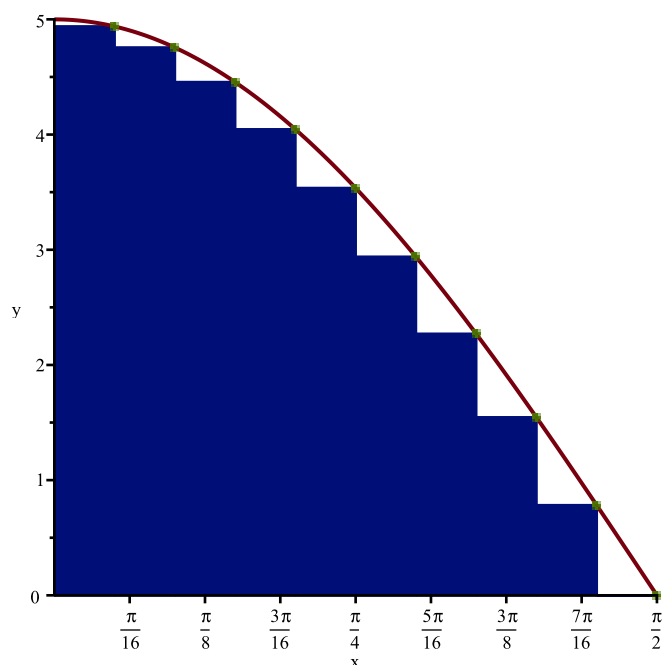




*ApproximateInt(5 * cos(x), 0 .. 1 / 2 * Pi, 'partition' = 10, 'method' = right, 'partitiontype' = normal, 'output' = 'value', 'boxoptions' = ['filled' = ['transparency' = .5]]);*

$$\frac{\pi \sqrt{2} \sqrt{5}}{16} + \frac{3 \pi \sqrt{2}}{16} + \frac{\pi \sqrt{2} \sqrt{5 + \sqrt{5}}}{16} + \frac{\pi \sqrt{5 + \sqrt{5}}}{8} + \frac{\pi \sqrt{5}}{8} + \frac{\pi \sqrt{2} \sqrt{5 - \sqrt{5}}}{16} \quad (1)$$

evalf (%)

$$4.597015850 \quad (2)$$

with(Student[CalculusI])

[AntiderivativePlot, AntiderivativeTutor, ApproximateInt, ApproximateIntTutor, ArcLength, (3)

ArcLengthTutor, Asymptotes, Clear, CriticalPoints, CurveAnalysisTutor, DerivativePlot, DerivativeTutor, DiffTutor, Distance, ExtremePoints, FunctionAverage, FunctionAverageTutor, FunctionChart, FunctionPlot, GetMessage, GetNumProblems, GetProblem, Hint, InflectionPoints, IntTutor, Integrand, InversePlot, InverseTutor, LimitTutor, MeanValueTheorem, MeanValueTheoremTutor, NewtonQuotient, NewtonsMethod, NewtonsMethodTutor, PointInterpolation, RiemannSum, RollesTheorem, Roots, Rule, Show, ShowIncomplete, ShowSolution, ShowSteps, Summand, SurfaceOfRevolution, SurfaceOfRevolutionTutor, Tangent, TangentSecantTutor, TangentTutor, TaylorApproximation, TaylorApproximationTutor, Understand, Undo, VolumeOfRevolution, VolumeOfRevolutionTutor, WhatProblem]

?ApproximateInt

*evalf(ApproximateInt(5 * cos(x), 0 .. 1 / 2 * Pi, 'partition' = 30, 'method' = right, 'partitiontype' = normal, 'output' = 'value', 'boxoptions' = ['filled' = ['transparency' = .5]]))*

$$4.867957940 \quad (4)$$

*evalf(ApproximateInt(5 * cos(x), 0 .. 1 / 2 * Pi, 'partition' = 50, 'method' = right, 'partitiontype' = normal, 'output' = 'value', 'boxoptions' = ['filled' = ['transparency' = .5]]))*

$$4.921048941 \quad (5)$$

$$\begin{aligned} & \text{evalf}(\text{ApproximateInt}(5 \cdot \cos(x), 0 \dots 1/2 \cdot \text{Pi}, \text{'partition'} = 100, \text{'method'} = \text{right}, \text{'partitiontype'} \\ & \quad = \text{normal}, \text{'output'} = \text{'value'}, \text{'boxoptions'} = [\text{'filled'} = [\text{'transparency'} = .5]])) \\ & \quad \quad \quad 4.960627283 \end{aligned} \tag{6}$$

$$\begin{aligned} R &:= n \rightarrow \frac{\text{Pi}}{2 \cdot n} \cdot \sum_{k=1}^n \left(5 \cdot \cos\left(\frac{\text{Pi} \cdot k}{2 \cdot n}\right) \right) \\ R &:= n \mapsto \frac{\pi \cdot \left(\sum_{k=1}^n 5 \cdot \cos\left(\frac{\pi \cdot k}{2 \cdot n}\right) \right)}{2 \cdot n} \end{aligned} \tag{7}$$

$$\begin{aligned} & \text{evalf}(R(10)) \\ & \quad \quad \quad 4.597015850 \end{aligned} \tag{8}$$

$$\begin{aligned} & \text{evalf}(R(30)) \\ & \quad \quad \quad 4.867957939 \end{aligned} \tag{9}$$

$$\begin{aligned} & \text{evalf}(R(50)) \\ & \quad \quad \quad 4.921048944 \end{aligned} \tag{10}$$

$$\begin{aligned} & \text{evalf}(R(100)) \\ & \quad \quad \quad 4.960627294 \end{aligned} \tag{11}$$

$$\begin{aligned} & \lim_{n \rightarrow \infty} (R(n)) \\ & \quad \quad \quad 5 \end{aligned} \tag{12}$$