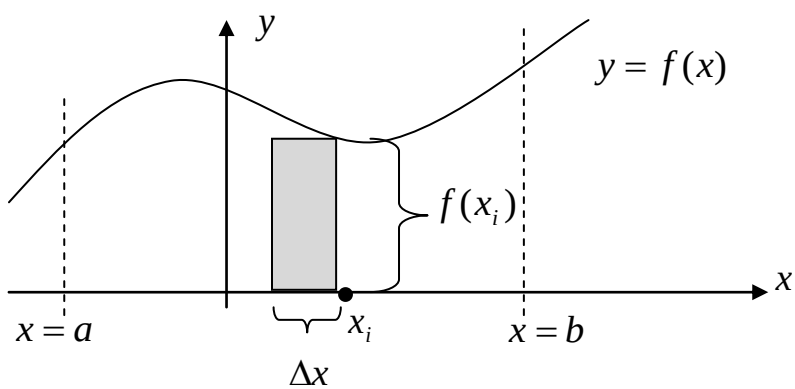
Math 140 Final Exam Fall 2012
Integration only

13. Find the indefinite integral. $\displaystyle\int \frac{2x+5\sqrt{x}-4}{x}\,dx$

14. Complete the limit definition of the area of a region,

The limit definition of the area of a region bounded by the graphs of $y=f(x)$, $x=a$, $x=b$ and the x-axis is given by

$$A=\lim_{n\to\infty}\sum_{i=1}^{n} f(x_i)\Delta x$$

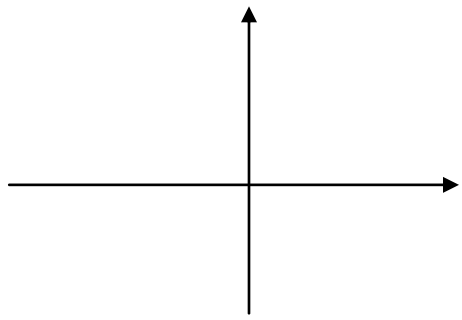


where

Δx is the _____of each rectangle, and
x_i are the _____ of each rectangle, and
$f(x_i)$ are the _____ of each rectangle.

15. ***Sketch and shade*** the region represented by the definite integral and use ***geometry*** to evaluate.

$$\int_0^1 \sqrt{1-x^2}\,dx =$$



16. Find the indefinite integral: $\displaystyle\int \frac{x}{\sqrt{25-x^2}}\,dx$

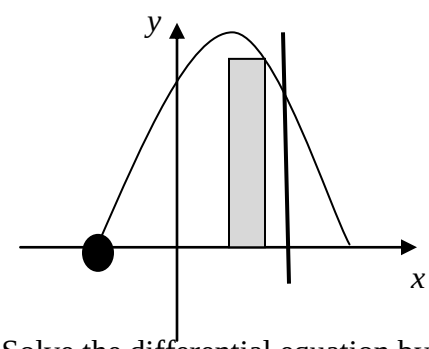
17. Find the indefinite integral. $\int (1+\tan y)dy$

18. Find the indefinite integral. $\int \frac{1}{\sqrt{6-4x-x^2}}dx$

19. .Find the indefinite integral. $\int \frac{3x^3+15x+1}{x^2+5}dx$

20. Find the indefinite integral: $\int xe^{x^2}dx$

21. Find the area of the region bounded by the graphs of the equations, $f(x)=4+3x-x^2$, $x=2$ and the *x*-axis, as shown, in the figure.



Bonus: Solve the differential equation by separation of variables.

$$y = y' \cos^2 x$$

$$y(\pi) = 1$$

Final exam scores (only) will be posted on the course website as soon as possible. Course letter grades will not be posted on the website BUT be available through elion as soon as possible.