

MATH 2
PROBLEM OF THE WEEK 8
Due Friday, February 28th, 2003 before the quiz.

Please show all your work!

Name: _____

We have four ways to estimate the area under a curve of a function: left and right Riemann sums, the trapezoid rule and the parabolic rule. In each of the following cases, tell whether each of these four rules over estimates the area, under estimates the area or gives the exact value of the area.

- (1) $f(x)$ is constant
- (2) $f(x)$ is increasing and concave up
- (3) $f(x)$ is increasing and concave down
- (4) $f(x)$ is decreasing and concave up
- (5) $f(x)$ is decreasing and concave down

EXTRA-CREDIT: Show that if $f(x)$ is a cubic polynomial the parabolic rule gives the exact value for the area.