Time OK allowed 27m

MATH 131
Quiz VII
November 23, 1993

$\bar{x} = 24.0/30$
$m = 26$

started class @ 16
? by 19
med = 22 all by 27

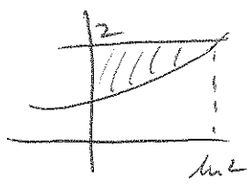
Name Key

6 1. What is $\lim_{n\to\infty} \sum_{k=1}^{n} \sqrt{1 + c_k}\ \Delta x_k$, for [1,3] ?

same integrand

$$\int_1^3 \sqrt{1+x}\,dx$$

7 2. Find the area between the curves $y = e^x$, $y = 2$, and the y-axis. Sketch the region.



$$\int_0^{\ln 2} 2 - e^x\,dx = 2x - e^x \Big|_0^{\ln 2}$$

7 all

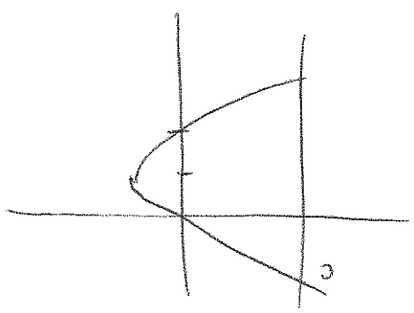
$$= 2\ln 2 - e^{\ln 2} - (0 - e^0)$$

may close ($\frac{1}{2}$)

$$= 2\ln 2 - 2 + 1$$
$$= 2\ln 2 - 1$$
$$= .3863$$

8 3. Find the area between the curves $x = y^2 - 2y$ and $x = 3$. Sketch the region.

10 all
must close



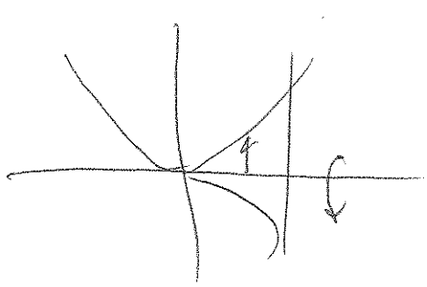
$$\int_{-1}^{3} 3 - (y^2 - 2y)\,dy = \int_{-1}^{3} 3 - y^2 + 2y\,dy$$

$y^2 - 2y = 3$
$y^2 - 2y - 3 = 0$
$(y-3)(y+1) = 0$
$y = -1, 3$

$$= 3y - \frac{y^3}{3} + y^2 \Big|_{-1}^{3}$$
$$= 9 - \frac{27}{3} + 9 - \left(-3 - \frac{(-1)}{3} + 1\right)$$
$$= 18 - 9 - \left(-2 + \tfrac{1}{3}\right)$$
$$= 11 - \tfrac{1}{3} = 10\tfrac{2}{3}$$
$$= \frac{32}{3}$$

8 4. Find the volume of the solid generated by revolving about the x-axis the region bounded by $y = x^2$, $x = 2$, and the x-axis. Sketch the region.

10 all
must close



$$\int_0^2 \pi (x^2)^2\,dx = \int_0^2 \pi x^4\,dx$$

$$= \frac{\pi x^5}{5} \Big|_0^2 = \frac{32\pi}{5}$$