MATH 3B WORKSHEET 10

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1. Arc length

1. What's the formula for arc length?

2. Set up the integral that represents the length of the curve.

(1) $y = \sin x$, $0 \leqslant x \leqslant \pi$.
(2) $y = xe^{-x}$, $0 \leqslant x \leqslant 2$.
(3) $x = y^2 - 2y$, $0 \leqslant y \leqslant 2$.
(4) $x = \sqrt{y} - y$, $1 \leqslant y \leqslant 4$.
(5) $*y^2 = \ln x$, $-1 \leqslant y \leqslant 1$.

2. Integrate by parts

(1) Integrate $\int_1^2 x^4(\ln x)^2 dx$.
(2) Integrate $\int e^{\sqrt{x}} dx$.

3. Partial fractions

Steps for partial fractions?

(1)
(2)
(3)
(4)

Integrate $\int \frac{x^6-1}{x^4-x^3+2x^2}dx$.

4. VOLUME OF REVOLUTION

Use both disk method and shell method to find the integral of the following solid of revolution:
The area bounded by $x = y^2 - 1$, $y = (x + 1)^3$, rotating about $y = 3$.

5. Quizzes

NAME:_____ PERM:_____ SECTION TIME:_____

Set up the integral that represents the length of the curve

$$y = x - \ln x,\ 1 \leqslant x \leqslant 4.$$