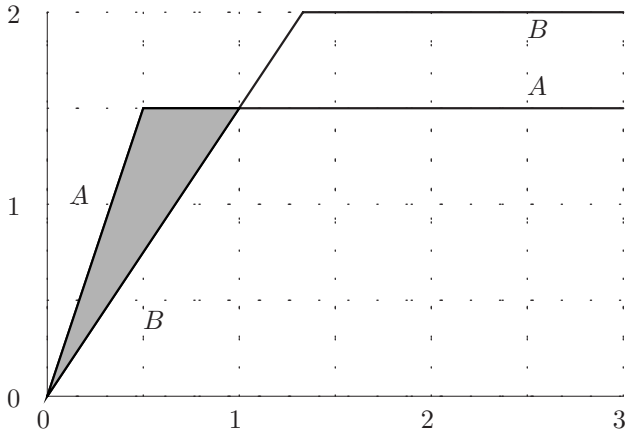
MAC 2311 Calculus 1 **Test 6** 23 Nov 2004

Directions: Show **ALL** work for credit; Give **EXACT** answers when possible; Start each problem on a **SEPARATE** page; Use only **ONE** side of each page; Be neat; Leave margins on the left and top for the **STAPLE**; Calculators can be used for graphing and calculating only; Nothing written on this page will be graded;

1. Two cars, A and B, start side by side and accelerate from rest. The figure below shows the graphs of their velocity functions.



   (a) Which car is ahead after one minute? Explain.

   (b) What is the meaning of the area of the shaded region?

   (c) Estimate the time at which the cars are again side by side.

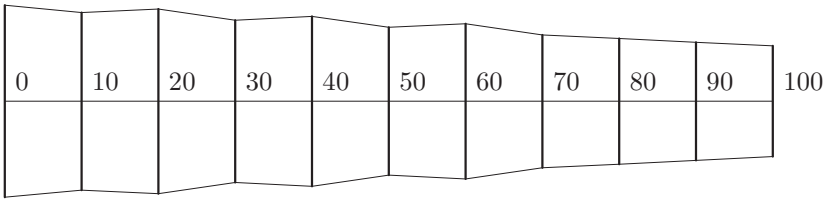
2. Evaluate these indefinite integrals:

$$(A) \quad \int 6x^2 \sin(x^3 - 5)\, dx \qquad\qquad (B) \quad \int \frac{x^2}{2x+3}\, dx$$

3. For the region R bounded by $y = f(x) = (x-1)^2 \sin^2 x$, $y = 0$, $x = 0$ and $x = 1$ write but **DO NOT EVALUATE** integrals which will give the volume when the region R is rotated about the x-axis and when the region R is rotated about the y-axis.

4. Sketch the region enclosed by the curves $y = 1 - x^2$ and $y = x^2 - 2x - 3$, and find area of the region.

5. A 100 cm long log has its diameter measured every 10 cm and the results are collected in the table below. Use the midpoint rule to obtain an **EXACT** approximation the volume of the log.



distance from end (in cm)	0	10	20	30	40	50	60	70	80	90	100
diameter (in cm)	26	24	25	22	23	20	21	18	17	16	15