

## 2003 Form B AB6

A.

$$f''(x) = \sqrt{f(x)} + x \frac{f'(x)}{2\sqrt{f(x)}} = \sqrt{f(x)} + \frac{x^2}{2}$$

$$f'(3) = \sqrt{25} + \frac{9}{2} = \frac{19}{2}$$

B.

$$\frac{1}{y} dy = x dx$$

$$\int \frac{1}{y} dy = \int x dx$$

$$2\sqrt{y} = \frac{1}{2}x^2 + c$$

$$2\sqrt{25} = \frac{1}{2}3^2 + c \Rightarrow c = \frac{11}{2}$$

$$2\sqrt{y} = \frac{1}{2}x^2 + \frac{11}{2}$$

$$y = \left(\frac{1}{4}x^2 + \frac{11}{4}\right)^2 \text{ or } \frac{1}{16}(x^2 + 11)^2$$