EMCF 31

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1. Give an anti-derivative for $g(x) = x^3 + 2x - \sqrt{x}$.

   a. $4x^4 + x^2 - \frac{2}{3}x^{3/2}$

   b. $\frac{1}{4}x^4 + x^2 - \frac{2}{3}x^{3/2} - 1$

   c. $x^4 + \frac{1}{2}x^2 - \frac{3}{2}x^{3/2} - 2$

   d. $x^4 + x^2 - \frac{3}{2}x^{3/2}$

   e. $\frac{1}{4}x^4 + x^2 - \frac{3}{2}x^{3/2} - 2$

   f. None of these.

2. Give the area in the first quadrant bounded between the graphs of $f(x) = x$ and $g(x) = x^2$.

   a. 1/6
   b. 1/3
   c. 1/4
   d. 1/2
   e. 1/12
   f. None of these.

3. Compute $\frac{d}{dx}\int_{\pi}^{x} \sin(t)\,dt$.

   a. $-\cos(x)$

   b. $-\sin(x)$

   c. $\cos(x)$

   d. $\sin(x)$

   e. None of these.

4. Compute $\frac{d}{dx}\int_{x}^{\pi} \sin(t)\,dt$.

   a. $-\cos(x)$

   b. $-\sin(x)$

   c. $\cos(x)$

   d. $\sin(x)$

   e. None of these.

5. Compute $\frac{d}{dx}\int_{x}^{\pi}\sin\left(t^2\right)dt$.

   a. $-\cos(x^2)$

   b. $-\sin(x^2)$

   c. $\cos(x^2)$

   d. $\sin(x^2)$

   e. None of these.

6. Compute $\frac{d}{dx}\int_{2}^{x}\sin\left(t^2\right)dt$.

   a. $2x\cos(x^2)$

   b. $2x\sin(x^2)$

   c. $\cos(x^2)$

   d. $\sin(x^2)$

   e. None of these.

7. Compute $\frac{d}{dx}\int_{3x}^{\pi}\sin\left(t^2\right)dt$.

   a. $-\cos(9x^2)$

   b. $-\sin(9x^2)$

   c. $-3\cos(9x^2)$

   d. $3\sin(9x^2)$

   e. None of these.

8. Compute $\frac{d}{dx}\int_{3}^{3x}\sin\left(t^2\right)dt$.

   a. $-\cos(9x^2)$

   b. $-\sin(9x^2)$

   c. $-3\cos(9x^2)$

   d. $3\sin(9x^2)$

   e. None of these.

9. Compute $\frac{d}{dx}\int_{3x}^{2x} \sin\left(t^2\right) dt$.

   a. $2\cos(4x^2) - 3\cos\left(9x^2\right)$

   b. $2\sin(4x^2) - 3\sin\left(9x^2\right)$

   c. $2x\cos(4x^2) - 3x\cos\left(9x^2\right)$

   d. $2x\sin(4x^2) - 3x\sin\left(9x^2\right)$

   e. None of these.

10. Compute $\frac{d}{dx}\int_{2x}^{3x} \sin\left(t^2\right) dt$.

   a. $-2\cos(4x^2) + 3\cos\left(9x^2\right)$

   b. $-2\sin(4x^2) + 3\sin\left(9x^2\right)$

   c. $-2x\cos(4x^2) + 3x\cos\left(9x^2\right)$

   d. $-2x\sin(4x^2) + 3x\sin\left(9x^2\right)$

   e. None of these.