

<p>1. <math>F(x) = \sin 3x - \cos 2x</math> is an anti-derivative of <math>f(x)</math> on <math>\left[0, \frac{\pi}{6}\right]</math>. Find the exact value of <math>\int_0^{\frac{\pi}{6}} f(x) dx</math>.</p>	<p>2. <math>F(x) = x \log_e  x </math> is an anti-derivative of <math>f(x)</math> on <math>[-2, -1]</math>. Find the exact value of <math>\int_{-2}^{-1} f(x) dx</math>.</p>
<p>3. <math>F(x) = x^2 e^{-x}</math> is an anti-derivative of <math>f(x)</math> on <math>[-2, -1]</math>. Find the exact value of <math>\int_{-1}^{-2} f(x) dx</math>.</p>	<p>4. Find the indefinite integral of <math>(3 - 2x)^{-3}</math>.</p>
<p>5. Evaluate <math>\int_{-3}^{-1} \frac{2}{1-x} dx</math>.</p>	<p>6. Find <math>\int (\sqrt{3x-2})^{-1} dx</math>.</p>
<p>7. Given <math>f(x) = 2\left(e^{\frac{x}{2}} - e^{-\frac{x}{2}}\right)</math>, find <math>\int f(x) dx</math>.</p>	<p>8. Evaluate <math>\int_0^{-\pi} \sin\left(\frac{x}{2}\right) dx + \int_0^{\pi} \sin\left(\frac{x}{2}\right) dx</math>.</p>
<p>9. Evaluate <math>\int_0^{\frac{1}{2}} \left[ \frac{d}{dx} \left( \frac{1}{x^2 - x + 1} \right) \right] dx</math>.</p>	<p>10. Given <math>\int_0^{\pi^2} g(x) dx = \pi</math>, evaluate <math>\int_0^{\pi^2} \left[ \cos\left(\frac{x}{2\pi}\right) - 2g(x) \right] dx</math>.</p>
<p>11. Evaluate <math>\int_1^3 \left( \frac{1+x^3}{x+1} \right) dx</math>.</p>	<p>Numerical, algebraic and worded answers.</p> <ol style="list-style-type: none"> <li>1. 3/2</li> <li>2. <math>\log 4</math></li> <li>3. <math>4e^2 - e</math></li> <li>4. <math>1/[4(3-2x)^2] + c</math></li> <li>5. <math>\log 4</math></li> <li>6. <math>2\sqrt{(3x-2)/3} + c</math></li> <li>7. <math>4(e^{x/2} + e^{-x/2}) + c</math></li> <li>8. 4</li> <li>9. 1/3</li> <li>10. 0</li> <li>11. 20/3</li> </ol>