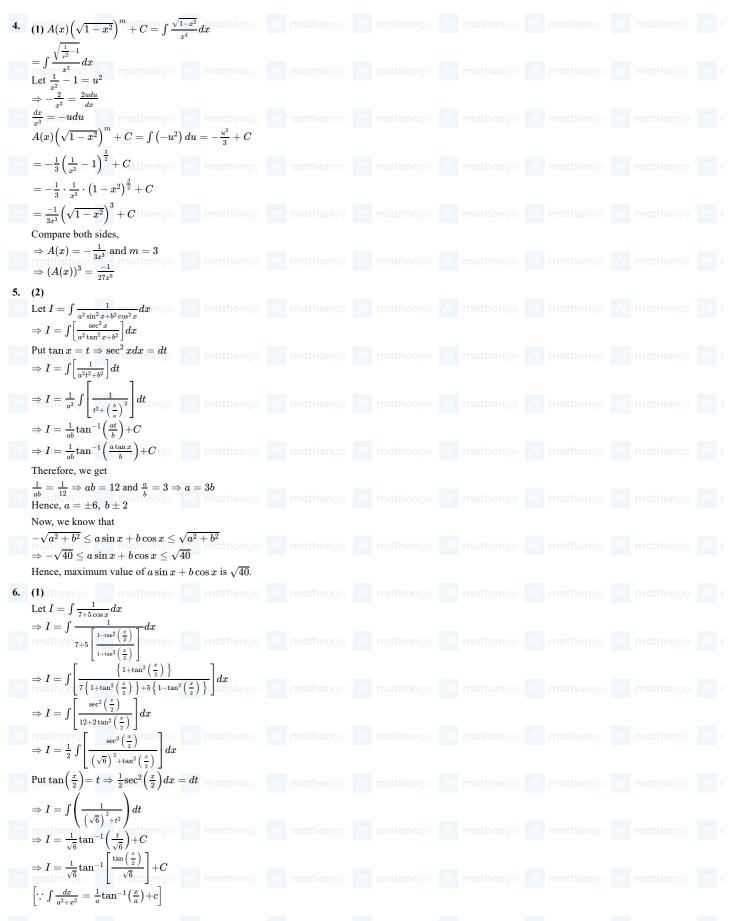


ANSWER KEYS 2. (1) **3.** (1) **4.** (1) **5.** (2) **6.** (1) 7. (2) **1.** (1) 9.(2) mathongo 10.(2) athongo 11. mathongo 11. mathongo 11. mathongo 11. mathongo 11. mathongo 11. mathongo 11. Put $x + 2 = \tan \theta$; $dx = \sec^2 \theta$ $I = \int \frac{d\theta}{\sec^2 \theta} = \int (\cos^2 \theta) d\theta = \int \frac{1+\cos 2\theta}{2} d\theta = \frac{\theta}{2} + \frac{\sin 2\theta}{4} + c$ mathongo /// $=\frac{\tan^{-1}(x+2)}{2}+\frac{(x+2)}{2(x^2+4x+5)}+c \quad \text{///} mathongo \quad \text$ 2. (1) $I = \int \frac{dx}{\sec x + \csc x}$ $= \int \frac{1}{2} \times \frac{2 \sin x \cos x}{\sin x + \cos x} dx$ mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo $= \frac{1}{2} \int \frac{\left(\sin x + \cos x\right)^2 - 1}{\sin x + \cos x} dx$ $=\frac{1}{2}\int(\sin x + \cos x)dx - \frac{1}{2}\int\frac{1}{\sin x + \cos x}dx \text{ mathongo } \text{ ma$ athongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. $=\frac{1}{2}(-\cos x + \sin x) - \frac{1}{2\sqrt{2}} \int \frac{1}{\sin(x + \frac{\pi}{4})} dx$ $=\frac{1}{2}(-\cos x+\sin x)-\frac{1}{2\sqrt{2}}\int \csc\left(x+\frac{\pi}{4} ight)\!dx$ We know that, $cosec\theta - cot\theta = \frac{1}{\sin \theta} - \frac{\cos \theta}{\sin \theta}$ $=\frac{1-\cos\theta}{1-\cos\theta}$ $2\sin^2\frac{\theta}{2}$ $2 \sin \frac{\theta}{2} \cos \frac{\theta}{2}$ mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// $I = \frac{1}{2}(-\cos x + \sin x) - \frac{1}{2\sqrt{2}}(\log \left|\tan\left(\frac{x}{2} + \frac{\pi}{8}\right)\right|) + c$ 3. (1) $=\int \frac{1}{x^2 \left(1+\sqrt{1+\frac{1}{x}}\right)^2} dx$ /// mathongo // mathongo // mathongo // mathongo // mathongo // mathongo // mathon put $1+\frac{1}{x}=t^2$ $-rac{1}{r^2}dx=2tdt$ or $\overset{x^2}{I}=\intrac{-2t}{\left(a+t ight)^2}=-\intrac{2t}{t^2+2t+1}dt$ $=-\Bigl[\intrac{2t}{t^2+2t+1}dt-\intrac{2}{t^2+2t+1}dt\Bigr]$ $=-\left[\ln{(t+1)^2}-2\int_{-(t+1)^2}^{-1}dt\right]$ $=-\left[2\ln(t+1)+rac{2}{t+1}-c ight]$







Answer Keys and Solutions

