

1. What are the three Pythagorean trigonometric identities?
2. What are the power reduction (half angle) formulas for $\sin^2 x$ and $\cos^2 x$?
3. Evaluate the following integrals

(a) $\int \sin^4 x \, dx$

(b) $\int \frac{\sin x}{\cos^3 x} \, dx$

(c) $\int \cos^2 x \, dx$

(d) $\int \sin^3 x \cos^2 x \, dx$

(e) $\int_0^{\pi/2} \sin^2 x \cos^2 x \, dx$

(f) $\int \sin^3 x \, dx$

(g) $\int x \sec^2(x^2) \tan^4(x^2) \, dx$

(h) $\int \tan^2 x \, dx$

(i) $\int \tan^5 x \sec^3 x \, dx$

(j) $\int \sin(8x) \cos(5x) \, dx$

(k) $\int x^2 \sin x \, dx$

(l) $\int \frac{1 - \tan^2 x}{\sec^2 x} \, dx$

(m) $\int_{\pi/4}^{\pi/2} \cot^3 x \, dx$

(n) $\int \sec^2 x \, dx$

(o) $\int \csc x \cot x \, dx$