[1]   Evaluate each integral.

(a) $\int e^x \cos(2x)\, dx$

(b) $\int \sin(-4x)\cos(3x)\, dx$

(c) $\int\limits_{0}^{2} e^{-x} \cos(x)\, dx$

(d) $\int \dfrac{\sin^2(x) - \cos^2(x)}{\cos(x)}\, dx$

(e) $\displaystyle\int_{-\pi}^{\pi} \sin(3\theta)\cos(\theta)\,d\theta$

(f) $\displaystyle\int \frac{1}{\sec(x)\tan(x)}\,dx$

(g) $\int x \arcsin(x)\,dx$

(h) $\int \dfrac{3\cos(x)}{\sin^2(x)+\sin(x)-2}\,dx$

(i) $\displaystyle\int \frac{\sqrt{4x^2+9}}{x^4}\,dx$

(j) $\displaystyle\int \frac{1}{\left(x^2+3\right)^{3/2}}\,dx$

(k) $\displaystyle\int_{1}^{2} x \sec^{-1} x \, dx$

(l) $\displaystyle\int \frac{x^3 - x + 3}{x^2 + x - 2} \, dx$

(m) $\int \dfrac{x+2}{x^2-4x}\,dx$

(n) $\int \dfrac{2x-3}{(x-1)^2}\,dx$

(o) $\displaystyle\int_{0}^{\sqrt{3}/2} \frac{1}{\left(1-t^2\right)^{5/2}}\,dt$

(p) $\displaystyle\int_{1}^{5} \frac{x-1}{x^2\left(x+1\right)}\,dx$

(q) $\int (\ln x)^2 \, dx$

(r) $\int \sec^5 x \, dx$