1.–

a) Sol: $I = \dfrac{2}{35}\sqrt{x-1}\left(5x^3+6x^2+8x+16\right)+C$

b) Sol: $I = \dfrac{2}{3}\ln\left|\left(\sqrt{x+2}-1\right)\right|+\dfrac{4}{3}\ln\left|\left(\sqrt{x+2}+2\right)\right| = \dfrac{2}{3}\ln\left|\left(\sqrt{x+2}+x\right)\left(\sqrt{x+2}+2\right)\right|+C$

c) Sol: $I = \ln\left|\dfrac{\sqrt{x+1}+\sqrt{x-1}}{\sqrt{x+1}-\sqrt{x-1}}\right| - 2\arctan\sqrt{\dfrac{x-1}{x+1}}+C$

d) Sol: $I = \dfrac{2}{3}(1+x)^{3/2}+\dfrac{3}{4}(1+x)^{4/3}+\dfrac{6}{7}(1+x)^{7/6}+(1+x)+\dfrac{6}{5}(1+x)^{5/6}+\dfrac{3}{2}(1+x)^{2/3}+C$

e) Sol: $I = \sqrt{4-x^2}-4\arctan\sqrt{\dfrac{2-x}{2+x}}+C$

f) Sol: $I = 2\arctan\sqrt{\dfrac{1+x}{1-x}}-\sqrt{1-x^2}+C$

2.–

a) Sol: $I = \dfrac{1}{a^2}\dfrac{x}{\sqrt{a^2-x^2}}+C \quad (a\neq 0)$; if $a=0,\ I$ does not exist.

b) Sol: $I = -\dfrac{1}{a^2}\dfrac{x}{\sqrt{x^2-a^2}}+C \quad (a\neq 0)$; if $a=0,\ I=-\dfrac{1}{2x^2}+C.$

c) Sol: $I = -\dfrac{1}{a^2}\dfrac{x}{\sqrt{x^2-a^2}}+C \quad (a\neq 0)$; if $a=0,\ I=-\dfrac{1}{2x^2}+C.$

d) Sol: $I = \dfrac{a^2}{2}\arcsin\dfrac{x}{a}+\dfrac{x}{2}\sqrt{a^2-x^2}+C \quad (a\neq 0)$; if $a=0,\ I$ does not exist.

e) Sol: $I = \dfrac{1}{2}\arccos\dfrac{1}{x}+\dfrac{1}{2}\dfrac{\sqrt{x^2-1}}{x^2}+C.$

f) Sol: $I = -\dfrac{1+2x^2}{x\sqrt{1+x^2}}+C.$

3.–

a) Sol: $I = \dfrac{x-3}{\sqrt{4x^2-24x+37}}+C$

b) Sol: $I = \dfrac{1}{9}\dfrac{x+2}{\sqrt{-4x^2-16x-7}}+C$

c) Sol: $I = -\dfrac{x+1}{\sqrt{x^2+2x}}+C$

d) Sol: $I = \dfrac{x-1}{\sqrt{2-2x+x^2}}+C$

e) Sol: $I = \dfrac{x-b}{a^2\sqrt{a^2-b^2+2bx-x^2}} + C \quad (a \neq 0)$; if $a = 0,\ I$ does not exist.

f) Sol: $I = \dfrac{b-x}{a^2\sqrt{b^2-a^2-2bx+x^2}} + C \quad (a \neq 0)$; if $a = 0,\ I = -\dfrac{1}{2(x-b)^2} + C$

4.–

a) Sol: $I = \dfrac{2x+3}{4}\sqrt{x^2-x-1} + \dfrac{7}{8}\ln\left|x - \dfrac{1}{2} + \sqrt{x^2-x-1}\right| + C$

b) Sol: $I = \sqrt{x^2-2x+2} + \ln\left|x-1+\sqrt{x^2-2x+2}\right| + C$

c) Sol: $I = \sqrt{x^2+x+1} - \dfrac{5}{2}\ln\left|x + \dfrac{1}{2} + \sqrt{x^2+x+1}\right| + C$

d) Sol: $I = \dfrac{x}{4}\sqrt{2x^2-1} + \dfrac{5}{4\sqrt{2}}\ln\left|\sqrt{2}x + \sqrt{2x^2-1}\right| + C$

e) Sol: $I = -\arcsin\dfrac{3-2x}{\sqrt{5}\,(x-1)} + C$

f) Sol: $I = \dfrac{1}{x}\sqrt{x^2+2x-1} - \arcsin\dfrac{1-x}{\sqrt{2}\,x} + C$
