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a) $\int \left(\frac{2}{x} + \frac{2}{x^2}\right) dx = 2\int x^{-1} dx + 2\int x^{-2} dx = \boxed{2\ln|x| - \frac{2}{x} + k}$

b) $\int \frac{dx}{(x-1)^3} = \int (x-1)^{-3} dx = \frac{(x-1)^{-3+1}}{-3+1} + k = \boxed{-\frac{1}{2(x-1)^2} + k}$

c) $\int \frac{x+\sqrt{x}}{x^2} dx = \int \left(x^{-1} + x^{1/2-2}\right) dx = \int \left(x^{-1} + x^{-3/2}\right) dx =$

$= \ln|x| + \frac{x^{-3/2+1}}{-3/2+1} + k = \boxed{\ln|x| - 2\frac{1}{\sqrt{x}} + k}$

$\qquad \underset{-1/2}{}$

d) $\int \frac{-8}{1+x^2} dx = \boxed{-8\arctan x + k}$

e) $\frac{1}{2}\int \frac{2\cdot 3x}{1+x^2} dx = \frac{3}{2}\int \frac{2x}{1+x^2} dx = \boxed{\frac{3}{2}\ln(1+x^2) + k}$

f) $\frac{1}{3}\int \frac{-3x^2}{2-x^3} dx = \boxed{-\frac{1}{3}\ln(2-x^3) + k}$

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a) $\int \frac{dx}{3x-4} = \frac{1}{3}\int \frac{3dx}{3x-4} = \boxed{\frac{1}{3}\ln|3x-4| + k.}$

b) $\frac{1}{3}\int \frac{3\,dx}{(3x-4)^2} = \frac{1}{3}\int 3(3x-4)^{-2} dx = \frac{(3x-4)^{-2+1}}{(-2+1)3} = \boxed{-\frac{1}{(3x-4)3} + k.}$

c) $\int \sqrt{3x-4}\, dx = \frac{1}{3}\int 3(3x-4)^{1/2} dx = \frac{1}{3}\frac{(3x-4)^{3/2}}{3/2} = \boxed{\frac{2}{9}\sqrt[2]{(3x-4)^3} + k}$

d) $\int \sqrt[5]{\frac{1}{(3x-4)^3}}\, dx = \frac{1}{3}\int 3(3x-4)^{-3/5} dx = \frac{1}{3}\frac{(3x-4)^{-3/5+1}}{-3/5+1} + k$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \underset{2/5}{}$

$= \frac{1}{3\cdot 2}\sqrt[5]{(3x-4)^2} =$

$= \boxed{\frac{5}{6}\sqrt[5]{(3x-4)^2} + k.}$