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a) $\frac{\cos x}{x} = \frac{vu' - uv'}{v^2} = \frac{x\sin x - 1\cos x}{x^2}$

$= -\frac{\sin x}{x}$ $u = \cos x$ $v = x$ $= \frac{x\sin x - \cos x}{(x)^2}$

$u' = \sin x$ $v' = 1$

b) $x^2 - x - 12 < 0$

$(x-4)(x+3) < 0$

$x: 4, -3$

c) $y = \ln(3x)$

$= \ln(3 \times 2)$

$= 1.79$ (2.dp)

d) i $\int \sqrt{5x+1}$

$= \frac{1}{5x-1}$

$= \frac{x}{\frac{5x^2}{2} - x} + C$

ii $\int \frac{x}{4+x^2}$

$= \frac{x^2}{4x + \frac{x^3}{3}} + C$

e) $\int_0^6 (x+k)\,dx = 30$

$= \left[x^2 + kx\right]_0^6$

$= (6^2 + k) - (0^2 + k)$

$= 36 + k - k$

$=$

Additional writing space on back page.