Start here for Question Number: 2

a) $\frac{\cos x}{x} \Rightarrow \frac{u}{v}$

$\frac{\sin x - \cos x}{x^2}$

$\cos x (x^{-1}) \Rightarrow -1\cos x + \sin x(-x^{-2})$

$= \frac{\sin x - \cos x}{x^2}$

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

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

$\therefore$ $x+3 < 0$ or $x-4 < 0$ | $x+3 > 0$ or $x-4 > 0$

$x < -3$ $x < 4$ | $x > -3$ $x > 4$

$\therefore x < -3$ | $\therefore x > 4$

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

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

$\int \ln_e(ax+b) = \frac{ax+b}{a(x+n)}(x+n)$

Where $x = 2$

$y' = 3\ln(6)$

$\doteq 5.38$

d) i- $\int \sqrt{5x+1}\,dx = \int (5x+1)^{-1}$

$= -(5x+1)^{-2} \cdot 5 + C$

$= -5(5x+1)^{-2} + C \quad = -\frac{5}{(5x+1)^2} + C$

ii - $\int \frac{x}{\sqrt{4+x^2}}\,dx = \int x(4+x^2)^{-1}$

$= uv' + uv'$

$= -x(4+x^2)^{-2} + (4+x^2)^{-1}$

$= (4+x^2)(-x^{-2} + 1^{-1})$

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

$\left[\frac{x^2}{2} + kx\right]_0^6 = 30$

$\left[\frac{36}{2} + 6k\right] + [0+0] = 30$

$18 + 6k = 30$

$-6k = 12$

$k = -2$

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Start here for Question Number: 27

M $(3/2, 3/2)$

C $(1/2, 1/4)$

gradient

tngt @ C has $m = 1$

$y' = 1 = 2x$

$1/2 = x$

where $x = 1/2$, $y = (1/2)^2$

$= 1/4$