

56.4 #71 Evaluate $(x^{\frac{1}{2}})^2 + 2(x^{\frac{1}{2}})(x^{-\frac{1}{2}}) + (x^{-\frac{1}{2}})^2$

$$\int_4^9 (x^{\frac{1}{2}} + x^{-\frac{1}{2}})^2 dx = \int_4^9 (x + 2 + x^{-1}) dx$$

$$= \left[\frac{1}{2}x^2 + 2x + \ln|x| \right]_4^9 + c$$

#39 Eq'n of tangent line

$y = x^2 \ln x$ @ $(x_1, y_1) = (1, 0)$

$y' = 2x \ln x + x^2 \cdot \frac{1}{x} = 2x \ln x + x$ Product Rule:

$y'(1) = 2 \ln(1) + 1 = 1 = m_{\text{tan}}$ $(fg)' = f'g + fg'$

$y = m(x - x_1) + y_1$

$f = x^2 \rightarrow f' = 2x$

$g = \ln x \rightarrow g' = \frac{1}{x}$

$y = 1(x - 1) + 0$

$f'g + fg' =$

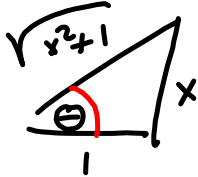
$y = x - 1$

$2x \ln x + x^2 \cdot \frac{1}{x}$

5^r 6.6
#14

$$\cos(2\theta) = \cos^2\theta - \sin^2\theta$$

$$\cos(2\tan^{-1}(x)) = \cos^2(\tan^{-1}x) - \sin^2(\tan^{-1}x)$$



$$\theta = \tan^{-1}x$$

$$= \left(\frac{1}{\sqrt{x^2+1}}\right)^2 - \left(\frac{x}{\sqrt{x^2+1}}\right)^2$$

$$= \frac{1-x^2}{x^2+1}$$