354.orr 7) Arctg x $$\int \frac{1}{1+x^2} dx = arctg\, x + k$$

a) $\int \frac{2dx}{1+25x^2} dx = \frac{2}{5}\int \frac{5\,dx}{1+(5x)^2} = \frac{2}{5} arctg\,(5x) + k.$

b) $\int \frac{5\,dx}{100x^2+1} = \frac{1}{2}\int \frac{2\cdot 5\,dx}{(10x)^2+1} = \frac{1}{2} arctg\,(10x) + k$

c) $\int \frac{4\,dx}{3+3x^2} = \frac{4}{3}\int \frac{dx}{1+x^2} = \frac{4}{3} arctg\,x + k$

d) $\int \frac{dx}{4+x^2} = \frac{1}{4^{1/2}}\int \frac{1/2\,dx}{1+(\frac{x}{2})^2} = \frac{1}{2} arctg\,(\frac{x}{2}) + k.$

e) $\int \frac{dx}{4+9x^2} = \frac{1}{4\cdot 3/4}\int \frac{3/2\,dx}{1+(\frac{3x}{2})^2} = \frac{1}{6}\int arctg\,(\frac{3x}{2}) + k$

f) $\int \frac{dx}{9+x^2} = \frac{1}{9\cdot 1/3}\int \frac{1/3\,dx}{1+(x/3)^2} = \frac{1}{3} arctg\,(\frac{x}{3}) + k$

g) $\int \frac{dx}{2+4x^2} = \frac{1}{2\sqrt{2}}\int \frac{\sqrt{2}}{1+(\sqrt{2}x)^2} = \frac{1}{2\sqrt{2}} arctg\,(\sqrt{2}x) + k$

h) $\int \frac{e^x}{1+e^{2x}} dx = \int \frac{e^x}{1+(e^x)^2} dx = arctg\,(e^x) + k.$