The function $f(x) = \frac{x^2}{x-1}$ is given. Calculate: $f(1-\sqrt{3})$, $f(2-\sqrt{3})$, $f(\operatorname{tg}\frac{\pi}{6})$.

variable – it changes its value.

1) $f(1-\sqrt{3}) = \frac{(1-\sqrt{3})^2}{1-\sqrt{3}-1} =$

$\frac{1-2\sqrt{3}+3}{-\sqrt{3}} =$

$\frac{4-2\sqrt{3}}{-\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} =$

$\frac{4\sqrt{3}-6}{-3} = \frac{6-4\sqrt{3}}{3}$

$(a-b)^2 = a^2 - 2ab + b^2$

$2\sqrt{3} \cdot \sqrt{3} = 2 \cdot 3 = 6$

2) $f(2-\sqrt{3}) = \frac{(2-\sqrt{3})^2}{2-\sqrt{3}-1} =$

$\frac{4-4\sqrt{3}+3}{1-\sqrt{3}} =$

$\frac{7-4\sqrt{3}}{1-\sqrt{3}} \cdot \frac{1+\sqrt{3}}{1+\sqrt{3}} =$

$\frac{7+7\sqrt{3}-4\sqrt{3}-12}{1-3} =$

$\frac{-5+3\sqrt{3}}{-2} = \frac{5-3\sqrt{3}}{2}$

$(a-b)^2 = a^2 - 2ab + b^2$

$(a-b)(a+b) = a^2 - b^2$

$4\sqrt{3} \cdot \sqrt{3} = 4 \cdot 3 = 12.$

3) $f(\operatorname{tg}\frac{\pi}{6}) = \frac{(\operatorname{tg}\frac{\pi}{6})^2}{\operatorname{tg}\frac{\pi}{6}-1} =$

$\frac{\left(\frac{\sqrt{3}}{3}\right)^2}{\frac{\sqrt{3}}{3}-1} = \frac{\frac{1}{3}}{\frac{\sqrt{3}-3}{3}} =$

$\frac{1}{3} : \frac{\sqrt{3}-3}{3} = \frac{1}{\cancel{3}} \cdot \frac{\cancel{3}}{\sqrt{3}-3} =$

$\frac{1}{\sqrt{3}-3} \cdot \frac{\sqrt{3}+3}{\sqrt{3}+3} = \frac{\sqrt{3}+3}{3-9} =$

$\frac{3+\sqrt{3}}{-6} = -\frac{1}{2} - \frac{\sqrt{3}}{6}$

$\pi = 180°$

$\frac{\pi}{6} = \frac{180°}{6} = 30°$ $\operatorname{tg}30° = \frac{\sqrt{3}}{3}$

$\left(\frac{\sqrt{3}}{3}\right)^2 = \frac{3}{9} = \frac{1}{3}$

$\frac{\sqrt{3}}{3} - 1 = \frac{\sqrt{3}}{3} - \frac{3}{3} = \frac{\sqrt{3}-3}{3}$

$(a-b)(a+b) = a^2 - b^2$