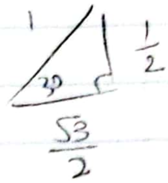
Group 4

Function: $\cos(x)$ centered at $\frac{\pi}{6}$



$f(x) = \cos x$	$f(a) = \frac{\sqrt{3}}{2}$
$f'(x) = -\sin x$	$f'(a) = -\frac{1}{2}$
$f''(x) = -\cos x$	$f''(a) = \frac{-\sqrt{3}}{2}$
$f'''(x) = \sin x$	$f'''(a) = \frac{1}{2}$
$f^{(4)}(x) = \cos x$	$f^{(4)}(a) = \frac{\sqrt{3}}{2}$
$f^{(5)}(x) = -\sin x$	$f^{(5)}(a) = -\frac{1}{2}$
$f^{(6)}(x) = -\cos x$	$f^{(6)}(a) = \frac{-\sqrt{3}}{2}$
$f^{(7)}(x) = \sin x$	$f^{(7)}(a) = \frac{1}{2}$
$f^{(8)}(x) = \cos x$	$f^{(8)}(a) = \frac{\sqrt{3}}{2}$
$f^{(9)}(x) = -\sin x$	$f^{(9)}(a) = -\frac{1}{2}$

$P_0(x) = f(a) \qquad = \frac{\sqrt{3}}{2}$

$P_1(x) = P_0(x) + f'(a)(x-a) \qquad = \frac{\sqrt{3}}{2} - \frac{1}{2}(x-\frac{\pi}{6})$

$P_2(x) = P_1(x) + \frac{1}{2!} f''(a)(x-a)^2 \qquad = \frac{\sqrt{3}}{2} - \frac{1}{2}(x-\frac{\pi}{6}) - \frac{\sqrt{3}}{4}(x-\frac{\pi}{6})^2$

$P_3(x) = P_2(x) + \frac{1}{3!} f'''(a)(x-a)^3 \qquad = \ldots + \frac{1}{12}(x-\frac{\pi}{6})^3$

$P_4(x) = P_3(x) + \frac{1}{4!} f^{(4)}(a)(x-a)^4 \qquad = \ldots + \frac{\sqrt{3}}{48}(x-\frac{\pi}{6})^4$

$P_5(x) = P_4(x) + \frac{1}{5!} f^{(5)}(a)(x-a)^5 \qquad = \ldots - \frac{1}{240}(x-\frac{\pi}{6})^5$

$P_6(x) = P_5(x) + \frac{1}{6!} f^{(6)}(a)(x-a)^6 \qquad = \ldots - \frac{1}{1440}(x-\frac{\pi}{6})^6$

$P_7(x) = P_6(x) + \frac{1}{7!} f^{(7)}(a)(x-a)^7 \qquad = \ldots + \frac{1}{10080}(x-\frac{\pi}{6})^7$

$P_8(x) = P_7(x) + \frac{1}{8!} f^{(8)}(a)(x-a)^8 \qquad = \ldots + \frac{\sqrt{3}}{80640}(x-\frac{\pi}{6})^8$

$P_9(x) = P_8(x) + \frac{1}{9!} f^{(9)}(a)(x-a)^9 \qquad = \ldots - \frac{1}{725760}(x-\frac{\pi}{6})^9$