

BC Topic

Maclaurin Polynomial (centered at c)

$$P_n(x) = f(c) + f'(c)(x-c) + \frac{f''(c)(x-c)^2}{2!} + \dots + \frac{f^{(n-1)}(c)(x-c)^{n-1}}{(n-1)!} + \frac{f^{(n)}(c)(x-c)^n}{n!}$$

Taylor Polynomial - centered at 0

(Ex) Write a 4th degree Taylor Polynomial for $f(x) = \sin x$

$$f(x) = \sin x$$

$$f'(x) = \cos x$$

$$f''(x) = -\sin x$$

$$f'''(x) = -\cos x$$

$$f^{(4)}(x) = \sin x$$

$$f(0) = 0$$

$$f'(0) = 1$$

$$f''(0) = 0$$

$$f'''(0) = -1$$

$$f^{(4)}(0) = 0$$

$$P_4(x) = 0 + x + 0 + \frac{(-1)x^3}{6} + 0$$

$$P_4(x) = x - \frac{x^3}{6}$$

You try
learn patterns
try center at $c=1$

4th degree

$$y = \cos x$$

$$y = e^x$$

$$y = \ln x$$

at $c=1$

Look at
BC FRQs
usually #6's
for practice