2 | 324
2 | 162
3 | 81
3 | 27
3 | 9
3

$\sqrt{324} = 2 \cdot 3 \cdot 3 = 18$

$\cos x = f(x)$ $\quad f(0) = 1$

$\cancel{f'(x) = -\sin x \quad f'(0) = 0}$

$\boxed{f''(x) = -\cos x \quad f''(0) = -1}$

$\cancel{f'''(x) = \sin x \quad f'''(0) = 0}$

$n=0 \quad (-1)^0 \; + \checkmark$

$n=1 \quad (-1)^1 \; - \checkmark$

$$\sum_{n=0}^{\infty} a_n x^n = \frac{f(0)}{0!}x^0 + \frac{f'(0)}{1!}x^1 + \frac{f''(0)}{2!}x^2 + \cdots + \frac{f^{(n)}(0)}{n!}x^n + \cdots$$

$$1x^0 - \frac{1}{2!}x^2 + \frac{1}{4!}x^4 + \cdots + (-1)^n \frac{x^{2n}}{(2n)!} + \cdots$$

$n=0 \qquad n=1 \qquad n=2$

$$= \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!}$$

$(-1)^n x^n \qquad (-1)^n \frac{x^{2n}}{(2n)!}$

$(-1)^n x^{2n}$

$(-1) x^{57n}$

$$= \cos x$$

So, $\cos(11x)$

$$= \boxed{\sum_{n=0}^{\infty} (-1)^n \frac{(11x)^{2n}}{(2n)!}}$$

$$= \sum_{n=0}^{\infty} (-1)^n \frac{11^{2n}}{(2n)!} x^{2n}$$

$$(x^2+5x+7)(x^2-3x+2) =$$

$$(7+5x+x^2)(2-3x+x^2)$$

$$= 14 - 21x + 7x^2$$
$$+10x - 15x^2 + \text{higher-degree terms.}$$
$$+2x^2 + \text{higher-degree terms.}$$

$$14 - 11x - 6x^2 + \text{higher degree terms.}$$

$$= 7(2-3x+x^2)$$
$$+5x(2-3x)$$
$$+x^2(2)$$

higher-degree terms.

Mar 25-12:26 PM

$$(x + x^3 + x^5 + x^7 + x^9 + x^{11})(1 + x^2 + x^4 + x^6 + x^8 + x^{10})$$

$x(1 + x^2 + x^4 + x^6 + x^8 + x^{10})$

$+ x^3(1 + x^2 + x^4 + x^6 + x^8)$

6 terms takes us up to 11th power.

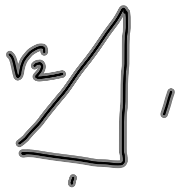
#5 1, $\underline{4}$, 7, $\underline{10}$, 13, $\underline{14}$, 17, $\underline{20}$, 23, $\underline{26}$, 29, 35

Hand in evens

§ 10.8 cont'd

(8) $f(x) = \tan x$ $\quad \boxed{a = \frac{\pi}{4}}$

$f(\frac{\pi}{4}) = 1$



$f'(x) = \sec^2 x \qquad f'(\frac{\pi}{4}) = 2$

$f''(x) = 2\sec x \cdot \sec x \tan x = 2 \cdot 2 \cdot 1 = 4$

$f(x) = 1 + 2x + \frac{4x^2}{2!} + \dots$

Not quite! we're centered $\overline{0!}$ $\overline{1!}$

at $x = a = \frac{\pi}{4}$. Need $x - a = x - \frac{\pi}{4}$ @ each step!

$f(x) = 1 + 2(x - \frac{\pi}{4}) + \frac{4(x - \frac{\pi}{4})^2}{2!} + \dots$

(23) Taylor's @ a = 2 for $x^3 - 2x + 4$.

$f(2) = 8 - 4 + 4 = 8$

$f'(x) = 3x^2 - 2$ $\quad f'(2) = 10$

$f''(x) = 6x$ $\quad f''(2) = 12$

$f'''(x) = 6$ $\quad f'''(2) = 6$

$$\boxed{f(x) = 8 + \underline{10(x-2)} + \underline{\frac{12}{2!}(x-2)^2} + \underline{\frac{6}{3!}(x-2)^3}}$$

$f(3) = 8 + 10 + 6 + 1$

$= 25$

$$\begin{array}{r|rrrr} 3 & 1 & 0 & -2 & 4 \\ & & 3 & 9 & 21 \\ \hline & 1 & 3 & 7 & \boxed{25 = f(3)} \end{array}$$

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