Taylor Review Part III:

① E $\lim_{n\to\infty} \frac{3}{K^{3/2}} = 0$

and

$\sum_{K=1}^{\infty} \frac{3}{K^{3/2}}$ conv by p-series

② C $\lim_{K\to\infty} \left| \frac{x^{K+1}}{(K+1)} \cdot \frac{K}{x^K} \right|$

$\lim_{K\to\infty} \left| x \cdot \frac{K}{(K+1)} \right|$

$= 1$

$|x| < 1$

$-1 < x < 1$

endpts:

$x = -1$ $\frac{(-1)^K}{K}$ conv AST

$x = 1$ $\frac{1^K}{K}$ div p-series

$-1 \le x < 1$

③ D $\cos x \approx 1 - \frac{x^2}{2!} + \frac{x^4}{4!}$

$\cos x - 1 \approx -\frac{x^2}{2!} + \frac{x^4}{4!}$

$x(\cos x - 1) \approx -\frac{x^3}{2} + \frac{x^5}{24}$

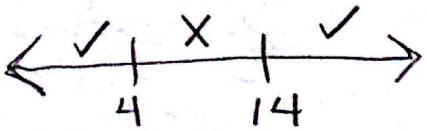
④ E $\left| \frac{5}{9-a} \right| < 1$

$\frac{5}{9-a} < 1$ $\frac{5}{9-a} > -1$

$a = 4$

$a = 14$

Test values



⑤ B $\int (-1)^K x^{2K}$

$= \frac{(-1)^K \cdot x^{2K+1}}{(2K+1)}$

⑥ A $\sum_{K=0}^{\infty} \frac{(-9)^K \cdot x^{4K}}{(2K)!}$

$1 + \frac{(-9)(x^4)}{2!} + \frac{(-9)^2 x^8}{4!}$

$\cos x \approx 1 - \frac{x^2}{2!} + \frac{x^4}{4!}$

$\cos(3x^2) = 1 - \frac{(3x^2)^2}{2!} + \frac{(3x^2)^4}{4!}$

⑦ C $\frac{f'''(0) \cdot x^3}{3!} = \frac{3x^3}{4}$

$\frac{f'''(0)}{6} = \frac{3}{4}$

$18 = 4 \cdot f'''(0)$

$f'''(0) = \frac{9}{2}$

⑧ D I. $\lim_{n\to\infty} \left| \frac{K^{3/2}+1}{5K^2+7} \cdot \frac{K^{1/2}}{1} \right| = 1$

LCT div

III. div AST

(9) $e^x \approx 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!}$

A $+ \ldots$

$e^{-\frac{1}{2}x^2} \approx 1 + -\frac{1}{2}x^2 + \frac{(-\frac{1}{2}x^2)^2}{2!} + \frac{(-\frac{1}{2}x^2)^3}{3!}$

$\frac{-\frac{1}{8}x^4}{6}$ $\quad -\frac{1}{48}x^4$

(10) $e^x \approx 1 + x + \frac{x^2}{2!} + \ldots \frac{x^6}{6!} + \ldots$

C $e^{-x} = 1 - x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} - \frac{x^5}{5!} + \frac{x^6}{6!} + \ldots$

$|\text{Error}|$

$|f(2) - T_6(2)| \leq \frac{2^7}{7!} \approx .0254$

Not A, B

$f(2) \approx .1353$

$T_5(2) \approx .0667$

$T_7(2) \approx .1302$

c) greater

d) less

e) less